ELECTRICAL REVIEW

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The Industry's Power

Will Unity Be Enforced?

FOR a considerable time past the various sections of the electricity supply industry have been anxiously trying to convince the "authorities" that they do not deserve to be extinguished or lose their several identities. So anxious have they appeared, and so critical of one another, that they have given to a scare raised by politicians an appearance of reality.

The nation generally is well served by electricity supply authorities—"public" and "private"—and yet it is being led to believe that the whole industry is rotten and that, by some miracle, if it were thoroughly "reorganised" the price of electricity would be placed almost on a giving-away basis, with installations and appliances thrown in. Little is said by the politicians of the thoroughly successful way in which the industry has met the strains and extraordinary demands which the war has engendered.

Political Solutions

Companies and municipalities, large and small, together with joint electricity authorities, have all contributed to the strengthening of the illusion by their internecine squabbles, until the beforementioned authorities feel that the time is drawing near when they can fall upon the industry and apply their political solutions to the imaginary, or at least exaggerated, problems.

One approach to the matter is made by way of fuel conservation. Having handled with conspicuous success the troubles of the coal industry—troubles which are now age-long—the Government thinks that it can call upon the coal-derivative industries to redress the balance in some way. That this "swing and roundabout" policy will probably result in a loss on the whole fair is disregarded.

A Suspicious Odour

There are other interests at work encouraging these ideas. Lord Brabazon, speaking at the E.D.A. luncheon last week, said that he had detected a strong odour of gas in the passages of the Ministry of Fuel and Power. Later in his remarks Lord Brabazon warned the Minister that his National Fuel Advisory Council, if it attempted to specify particular uses for particular forms of fuel, would cause the electricity supply industry, united as never before, to rise up in its might "and the Minister won't know what hit him."

Making due allowance for the nature and influence of the occasion, we still feel that Lord Brabazon is right, though somewhat optimistic about the united front. The Minister will certainly meet with much trouble if he countenances schemes for telling people whether they are to use electricity or gas. If the apparent disunity of the industry encourages the Ministry to proceed with such plans it will still have the public to contend with. As Mr. Hoadley said at the E.D.A. annual meeting, the industry must realise its power and impress upon the Government the fact that it (and its public) is not going to be dictated to for questionable ends. It would seem

that E.D.A. is the means of achieving this realisation, for in its membership all sections forget their differences and are bound together to promote the industry's beneficent purpose—the spread of electrical service to lighten labour, improve conditions of living and make that service ever more efficient.

Economy and Efficiency

MR. HOADLEY claimed that the Electrical Development Association was now more active than it had been for a long time and we think that the claim is well justified. It imposes a considerable strain upon the honorary officers and the Association's staff to inculcate economy of use and at the same time retain the public goodwill which it has taken many years to build up. The national advertisements which are now appearing seem to achieve this dual purpose admirably and Mr. Hoadley was obviously and justly proud of them. Similarly the new film, "Too Easy," as we said when we recently reviewed it, is good electrical propaganda as well as a good means of preaching economy. We agree with Mr. Hoadley that the two go together for the ultimate good of the industry and the public in peace as well as in war.

In Rural Areas

THE Association is actively pursuing the rural load, although it would have been thought that the authorities concerned with the erection of country dwellings would be pursuing E.D.A. for its advice and help. It is stated in the annual report that of 3,000 cottages 86 per cent. would have electrical service which, incidentally, seems to indicate that the development of rural areas is not so backward as some people maintain. A "considerable proportion" of these cottages are to have electric cooking and heating. This must be insisted upon if extensions in rural areas are to be justified. Two or three lamps per cottage is not enough to warrant expensive services.

I.M.E.A. Decisions

IT was perhaps a foregone conclusion that the proposal of the I.M.E.A. that the Central Electricity Board should take over all selected stations would receive the approval of the majority of the members at the meeting held last week, for a majority of the members do not own selected stations. It was evident from reports of a previous meeting that the municipal selected station owners were not in favour of the idea. At last week's I.M.E.A. meeting the operative part of the Joint Memorandum was referred back to the Committee which produced it with suggestions for "certain modifications." The nature of these modifications has not been officially disclosed, but it seems probable that the majority which secured the reference back objected to the proposal to suspend purchase rights until the Area Committees had examined the position, and maybe they were also afraid that some of the less efficient smaller municipal undertakings might be absorbed by others.

Still Hope

IT is the distribution side of the industry which reorganisers have their eyes upon. Nobody questions the efficiency of the selected stations; the benefits anticipated from a change in ownership are largely an expression of hope. If the supply industry can agree upon means of improving distribution and fostering development, all pretexts for wholehearted (and light-hearted) reorganisation should be countered. Accordingly, we are glad to have reason to hope that the I.M.E.A. decision on the Joint Memorandum does not mean that this substantial measure of agreement has been nullified. Representatives of the companies and the I.M.E.A. were to meet again last Wednesday, when it was hoped that a further, generally acceptable, joint memorandum would be framed.

Less Economy

STATISTICS of electricity and gas consumption during the December quarter of last year show that there was a rise above the figures for the corresponding period of 1942, particularly in the case of ordinary and credit meter consumers. Previously, it may be recalled, it was the prepayment consumer who was not economising to the desired extent. There are probably two reasons for the increase. First the supply of coal has been severely restricted and evidently householders have fallen back on gas and electricity to make up the deficiency. It is a remarkable fact that the greatest electrical increase was in a town in a mining area. Secondly, a minor cause may have been the slightly colder December quarter (average tem-

perature was 1 degree lower than in 1942). But whatever the reason may have been, there is evidently no room for any slackening of efforts to secure economy and supply authorities must endeavour to check this rising tendency.

The Load Curve

THE value of the I.E.E. paper by Mr. P. Schiller (as the discussion reported on another page shows) lies in the method of approach it gives towards a complex problem still needing further investigation rather than in its utility as a guide to future conditions. The principal disturbing feature is the large proportion of the potential load that is non-basic space heating, but it is the duty of supply engineers to cater for this. General policy cannot be determined by conditions providing for a short snap of exceptional cold, having regard to the differences between most economical and maximum continuous plant ratings and to the power reservoir provided by the grid.

Institution Sections

IN so increasingly diversified a field as that of electrical engineering the devolution upon sectional bodies of subjects of more specialised interest is almost inevitable. This tendency is to be welcomed on many grounds and the success of the I.E.E. Sections in London, it may be inferred from a statement made by the President, Sir Stanley Angwin, at the Transmission Section luncheon, is likely to encourage the formation of similar groups at local Centres, as it has already done in the case of wireless. Such arrangements should not, of course, prejudice the discussion of problems of a more generalised kind at the ordinary meetings (which still maintain a higher average attendance) as, whatever the more immediate technical interests of members, their work has always the common basis of engineering.

Wood as an "Insulator"

THE old idea that to stand on wood affords protection against serious electric shock at low voltages receives no support from the tests carried out by the Electrical Branch of the Factory Department. These were initiated as the result of the death of a boy through touching a faulty lamp lead while his foot made contact with a set of non-continuous rails that were spiked by 2-in. nails to a floor of oaken truck-buffer bars, 5½ in. thick. Ultimate contact with earth could have been made only through the wood, which was laid on a thick layer of ashes and sand. A "Megger" test between the rail and earth showed only 1,000 to 1,500 ohms, a value low enough for a lethal current to pass. Pressing the "Megger" connection on the wood gave 15,000 ohms to earth. The weather was dry and warm, but the area of timber and rails was large and iron oxide had probably impregnated the surface of the wood to some extent. It is to be doubted, however, whether the latter considerations are of material importance.

Too Few

SPEAKING from intimate knowledge of industrial conditions abroad, Dr. A. P. M. Fleming was able to assure the Manchester Chamber of Commerce last week that, as regards quality, research in this country is capable at all times of holding its own. He added the warning that the numbers engaged on such work will be far too small to cope with future industrial problems; for every person so employed there are three in the United states and five in Russia. The numerical disadvantage of a small population, as he stated, can be minimised through the cultivation of a scientific attitude of mind in industry so as to ensure that new developments are turned quickly to account and through the encouragement of more young people to become research workers, and by improved education and training.

Locomotive Coal

THE Parliamentary Secretary to the Minister of War Transport was not disposed to accept out of hand the statement by Mr. Walter Higgs in the House the other day that the present consumption of coal on the railways could be lessened by more than a half through electrification. Mr. Noel Baker need not go very far to find that this estimate was a very moderate one. The position has not appreciably changed since 1932, when Mr. J. M. (now Sir John) Kennedy (who later became deputy chairman of the Electricity Commission), in an address he gave as president of the Association of Supervising Electrical Engineers, estimated the probable reduction as from 13 million tons of locomotive fuel to 5 million tons of the lower grade burned in power stations.

Electrical Development

Speeches at Annual Luncheon

THE Minister of Town and Country Planning (MR. W. S. MORRISON) was the principal guest at the annual luncheon of the British Electrical Development Association which was held last Friday at the Connaught Rooms, W.C.2. LORD BRABAZON OF TARA, president, was in the chair, and the company included many representatives of all the branches of the electrical industry.

MR. MORRISON proposed the toast of the Association and in the course of his speech referred to the rapid growth of the electrical load since its establishment. There were two matters in which electricity had notably helped the planner. In so far as it enabled people and industries to be more mobile, to have a wider choice of habitation, electricity eased the task of the planner, for it made his material more elastic. Again, in so far as electricity enabled people in the country to enjoy urban amenities it added to the richness and variety of country life and counterbalanced some of the temptations which drew people from the country to the town.

Mr. W. S. Morrison with Lord Brabazon (president)

The planners should be able to assist electricity suppliers by giving them advance information to enable them to save the expense of haphazard development which resulted from sporadic and irregular building and roadmaking.

Speaking of the apprehension entertained in the industry that interim development authorities might delay or ban development unreasonably by refusing consent to the erection of overhead lines or the extension of necessary plant and buildings, Mr. Morrison saw no reason why, given common sense and goodwill, legitimate electrical enterprise should be hampered in any way.

LORD BRABAZON replied to the toast. After an appreciative reference to Mr. Morrison's public services, he said that the electricity supply industry had stood up in a way beyond all praise to the assaults of the enemy. It was E.D.A.'s job to find new uses for electricity and to promote efficiency.

There were some points on which the industry was in disagreement, but the Government should be chary in interfering with any of these "man and wife" quarrels. He expressed his admiration of the Electricity Commission; it had had a great chairman in Sir John Snell and a worthy successor had been found in Sir Cyril Hurcomb.

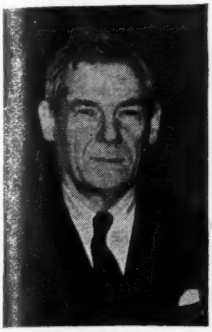
He was told that in some of the passages of the Ministry of Fuel and Power there was a very distinct smell of gas. The Ministry had set up a Fuel Efficiency Committee and E.D.A. supported it in securing the best use of our resources, but there was being conceived in the bowels of the Ministry a monster, which they hoped would be still-born, called or to be called the National Fuel Advisory Council.

That sounded all right but it meant nothing. But what it was going to do or what some people wanted it to do was to stipulate who was to use one form of power and who was to use another. This "frightful body" was apparently to tell us and our wives when we were to use electricity and when gas.

Much as they regretted the Minister's experience in the coal trade and sympathised with him in the trouble and anxiety he must have been caused, that would be as nothing compared with what he was running up against if he went on with this proposal. There would be such a combined front as had

Mr. V. W. Dale (assistant director) and Mr. E. E. Hoadley (chairman)

never before been seen in the electrical industry. The great municipalities, the great power companies, the manufacturers and the women of the country would rise in their might and the Minister "wouldn't know what hit him." There was no more perilous thing than for a politician to play with electricity.



Sir Cyril Hurcomb (chairman, Electricity Commission)

Annual Meeting

At the annual meeting which followed, Lord Brabazon presiding, MR. E. E. HOADLEY, chairman of the Council, presented the accounts and mentioned the encouragement given to the Council by the members in their unanimous and prompt response to the request of the Council for the full subscriptions this year. MR. J. W. J. TOWNLEY seconded the adoption of the accounts which were approved.

Moving the adoption of the annual report (which is summarised later), Mr. Hoadley said that the Association had done its best to carry out the work it was supposed to do although hedged about by restrictions. He claimed that the advertisements appearing in the national newspapers established a new technique in advertising—distinctive and dignified. The new film was a good economy film but also a good electrical film which taught the sane and efficient use of electricity. The Ministry of Fuel was arranging showings which would ordinarily have cost £30,000.

A Medical Advisory Panel was being set up and one of the greatest men in the medical profession would lend his name to it. A Farming and Agricultural Panel was also being formed.

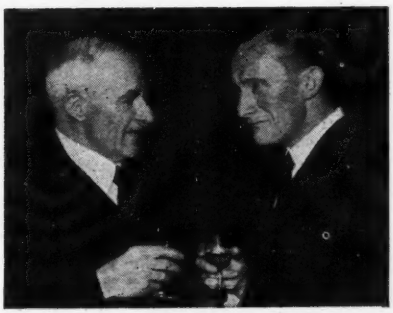
Mr. Hoadley said that he had had a happy, though strenuous, two years of office. He thanked Mr. C. Parker, the vice-chairman, and Mr. V. W. Dale, the chief executive officer, for their work. Lord Brabazon's speech at the luncheon had been an inspiration to go forward and put the electrical industry in its right place. It was time they told the Government Departments what they had got to do.

Replying to MR. E. A. LOGAN, Mr. Hoadley said that at present the Council could not do much more than consider a greatly enlarged E.D.A. to capture the domestic load as a post-war activity.

MR. J. W. J. TOWNLEY asked for suitable exhibition models of two types; one to show how pre-war apparatus could be used in the immediate post-war houses and the other showing the ideal of properly planned kitchens and equipment Mr. Hoadley said that the Architectural Advisory Service had produced designs for two sets of models for two classes of kitchen. Full-size models would be made as soon as material became available; quarter-scale models would be obtainable in the next six weeks.

MR. R. LEE suggested that individual undertakings should be asked to submit suggestions and it was pointed out that that had been done. MR. J. A. SUMNER called for greater attention to rural electrification. Mr. Hoadley said that this was one of the objects in setting up the Agricultural Advisory Panel.

Mr. H. T. Young and Mr. C. G. Morley New



Mr. B. Handley (Portsmouth) and Mr. E. R. Wilkinson (C.E.B.)

It was announced by Mr. Hoadley that Lord Brabazon had consented to continue as president for a further year and that Mr. A. C. Bossom, F.R.I.B.A., M.P., had been elected a vice-president.

ALDERMAN W. H. CRITCHLEY proposed a vote of thanks to Lord Brabazon and this was seconded by MR. H. R. RANDALL. Lord Brabazon responded.

MR. C. PARKER proposed a vote of thanks to Mr. Hoadley, which was seconded by

BRIG.-GEN. R. F. LEGGE. In acknowledging it, Mr. Hoadley said that in E.D.A. companies, municipalities and joint electrical authorities were all for electricity. He regretted that his hopes of the unity for which he had been working had been dashed at the previous day's meeting of the I.M.E.A.

Mr. C. Parker, the new chairman, with Mrs. Parker

E.D.A. was about to celebrate its 25th anniversary and it was the right body to organise a real "do" which would redound to the credit of the industry.

The meeting closed with votes of thanks to the technical Press and the officials of all the E.D.A. committees and circles.

Council's Report

In its report for the past year, the Council mentions that new members include Bridgend U.D.C., the Boroughs of Doncaster and Shoreditch and the Lancashire Electric Power Co.; the Pudsey U.D.C. decided to join as from January 1st, 1944. The subscription for the year was fixed at 50 per cent. of the normal and the full amounts were promptly remitted by all members.

There was marked expansion in activities during the year, including the resumption of national Press advertising, re-establishment of committees on special subjects, revival of exhibition activities and the resumption of film production and monthly issues of the "E.D.A. Bulletin." An Architectural Advisory Service and a Kitchen Planning Panel were established, together with an advisory service in connection with communal feeding and large-scale cooking. The commercial and technical information services were extended; post-war planning was given consideration and there were increased contacts with Government Departments.

A scheme of national Press advertising began in August and was continuing at the end of the year. "Prestige" advertisements, stressing electricity's vital part in the war effort, urging fuel economy, and promising good service for the future, appeared in thirty-six daily and weekly newspapers and thirty-four national magazines, with a combined circulation of 37 million. All local publicity services were maintained and special schemes were prepared. A good deal of attention was secured in the national newspaper Press.

Among the subjects covered by electrical displays in national exhibitions were post-war housing, town and country planning, the domestic front, fuel economy, nursery schools and safety-first. Twenty-five sets of photographic enlargements concerned with some of these subjects were on continuous loan to members and E.D.A. model kitchens were introduced into a number of provincial exhibitions.

Two earlier E.D.A. films and the C.E.B. film, "Power and Electricity," were revised for the Board of Education and are being used extensively in schools. Successful circulation has been arranged for a new film featuring Jeanne de Casalis. Another film, "Cooking for a Million," dealing with large-scale cookery, was to be completed early in the New Year and a script on "Post-War Housing" is also in course of preparation.

In addition to this, information is being collected with a view to the production of a historical record of the industry's contribution to the war effort.

Capt. J. M. Donaldson, Mr. V. Z. de Ferranti, Mr. Robert Nelson and Brig.-Gen. R. F. Legge

A good deal of work has been done in the matters of fuel economy and food and cookery. A joint E.D.A./B.E.A.M.A. Committee was formed to deal with heavy-duty cooking. Additional technical service reports were issued to members to assist them in the maintenance of domestic appliances, supplies of essential materials having been assured.

The Electric Cooking Committee approved the technical sub-committee's comprehensive proposals for the greater interchangeability of the wearing parts of electric cookers without restricting improvements in design. The Committee also suggested a number of points for consideration by manufacturers, for incorporation in the design of post-war cookers. Advice was also given by the Association with regard to panel heaters, water heaters and other appliances.

The Association has assisted Government Departments and bodies engaged in post-war planning and among the more unusual aspects dealt with were communal laundries, lifts for low-cost flats, trolley-buses and rural electrification. The Association was represented on committees appointed under the ægis of the Ministry of Works Directorate of Post-War Building, to study the future design of electrical installations, etc.

A panel of well-known architects, together with Alderman Mrs. Gregory, was established as a result of a report on post-war kitchens submitted to the Council last November. The panel has made excellent progress in drafting plans for post-war kitchens in small houses and flats.

A considerable amount of work was done on the design of electric wiring installations, appliances and fittings for prefabricated houses. Complete installation details were evolved in conjunction with the Corporation Electricity Department for a sample pair of houses erected in Coventry towards the end of the year. Advance information obtained from the Ministry of Health was issued to Association members in areas in which 3,000 rural cottages were to be erected. A wiring specification was prepared and official representations were made concerning the use of of electricity in the cottages. A survey revealed that 86 per cent. of the cottages would have electrical service and in spite of material shortages a considerable proportion of them would have electric cooking and heating. The Association is also investigating and inspecting elec-

Mr. W. Riggs (president, E.C.A.) and Mr. F. Rogers

Lt.-Col. W. A. Vignoles (former director of E.D.A.), Mr. W. H. Thickett and Mr. J. I. Bernard

Councillor J. Selwyn Jones, Mr. W. P. Lilwall and Mr. A. H. Todd

trical installations and facilities at domestic science training colleges throughout the country with a view to rendering such assistance as may be necessary to ensure that trainees shall be adequately instructed in the electrical sense. Preliminary discussions have taken place with the Board of Education concerning vocational courses at technical institutes, particularly with a view to meeting post-war service demands likely to arise in the electrical industry. Training schemes for demonstrators have been drafted by E.D.A. in conjunction with the E.A.W. for submission to the Board. A demonstrators' panel has been established for the purpose of rendering "good neighbour service" to undertakings at present without demonstrators, particularly where large-scale cooking equipment is being handled by inexperienced staffs.

Mr. R. F. Beddow, the Dowager Lady Swaythling and Mrs. A. Bentham

Reference is made in the report to a Demonstrators' Conference in September last, to street lighting, to the increase in technical inquiries and to the activities of the Building Centre. The Council expresses the opinion that a national testing station for domestic appliances is desirable, and the subject of establishing such a station within the E.D.A. organisation is being investigated.

The Report concludes with some notes on the work of the Electric Vehicle Association of Great Britain and the Electrical Association for Women.

The total membership rose from 396 to 399 and the revenue from £29,533 (25 per cent. of normal subscriptions) to £57,412 (44 per cent. of normal). General development work accounted for 57·4 per cent. of the total expenditure, area committees for 11·5 per cent. and salaries and wages for 15·8 per cent.

Instantaneous Gas Analysis

AN instrument known as an "ultra-violet photometer" has been designed by the DuPont Co. of New York for taking continuous samples of possibly polluted air and giving direct and instantaneous readings. Its operation is based on the particular absorption line in the spectrum of a gas at which wavelength a "shadow" is cast where the light would have fallen but for the absorption. Carbon bi-sulphide, for example, strongly absorbs light having a wavelength of 3,132 Au (in the ultra-violet range).

The air to be analysed is pumped through several small chambers which filter out dust, oil and moisture, and thence into a pair of tubes, about 31 in. long. The contaminated air runs into the first tube and then through a canister of activated charcoal, which removes the CS_2 and passes purified air into the second tube. The continuous comparison of the purified with the contaminated air enables minute differences to be detected.

Rays of ultra-violet light from a mercury lamp pass through the two tubes and fall on a sodium photo-cell mounted at the opposite end of each. The optical system, including filters, has been selected so that about 60 per cent. of the photometric response of the electric eye is caused by light of 3,132 Au. No other atmospheric element has been found that absorbs either this band of light or the 3,650 Au band, which accounts for most of the remainder of the photo-electric tube's response, so, when the analyser is affected, the operator knows it has "seen" the "shadow" of CS_2. One part in a million of air is claimed to produce an absorption of 0·02 of one per cent., detectable by the instrument.

A test is cited in which sixty-one readings were taken during the opening and cleaning of a large vessel in which material had been treated with CS_2. During most of the operation the concentration of gas remained below twenty parts per million and the ordinary analysis methods, which gave only an average for the interval, showed no danger points. The ultra-violet photometer, it is reported, revealed that the concentration rose to sixty parts per million at one moment and to forty parts at another. This led to modification of the ventilating equipment to eliminate such danger peaks.

Rumanian Ten Year Plan

LAST year the Rumanian Ministry of Public Works appointed a Directorate for Electrification to plan for the development of the whole country. The first report provides for the erection of power plants with a total capacity of 570,000 HP. The scheme also includes plans for the construction of transmission lines and the electrification of 3,000 km of railways. The total cost is estimated at 81 milliard lei. Installations so far constructed have cost 1·4 milliard lei, and a total of 5·7 per cent. of the country has been supplied with electricity.

Engineers of the Future—II

Part-Time Education

Prospects Raised by the New Bill

By Percy Dunsheath, M.A., D.Sc.

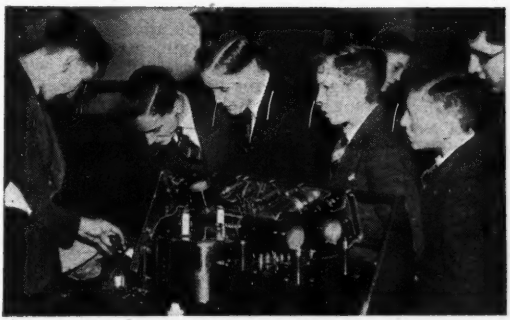
THE appearance of the Education Bill now before Parliament, with its important provisions for the raising of the school-leaving age and compulsory part-time education, is not only a landmark in the progress of education in this country, but a subject of great interest to British industry. Section 33 of the Bill, to come into operation on April 1st, 1945, raises the compulsory school leaving age to fifteen and envisages an Order in Council raising it to sixteen as soon as practicable. Section 41 lays upon local education authorities the duty of establishing Young People's Colleges "for young persons (up to the age of eighteen) such further education including physical, practical and vocational training as will enable them to develop their various aptitudes and capacities, and prepare them for the responsibilities of citizenship," and by Section 42, from a date to be fixed, all young persons will be compelled to attend such a college for one whole day or two half days weekly. In special cases, whole-time attendance for one period of eight weeks in the year or two periods of four weeks may be substituted.

Dr. Dunsheath is Director and Chief Engineer of W. T. Henley's Telegraph Works Co., Ltd.

Industry is thus faced with the loss of something like a quarter of its fourteens to eighteens from next April by the raising of the school-leaving age, and a further loss of one-sixth of the remainder soon after by compulsory day release. Clearly it must consider carefully the re-orientation called for by the change, and the possible economic effects. Some will see disaster in the prospect, but most will welcome the changes. Whatever the immediate reaction the situation offers to industry a unique opportunity for co-operation in the improvement of its most vital raw material—humanity.

It might be asked why engineers want to concern themselves about general questions of education; the training of engineers is their province, but can't the education of boys and girls be left to the educationist? Unfortunately, the answer is "No!" For many reasons those who direct industry must take more interest in this matter than they have done in the past. The smooth running of an industrial concern depends to a very great extent on the individual outlook of a number of human beings. Ignorant workpeople can cause trouble in many ways, through lack of discipline, unwillingness to co-operate, through accidents and liability to follow unwise leadership.

A second reason is to be found in connection with apprenticeship to skilled trades. It is not sufficient for a boy to have only the technical skill; he requires a groundwork of more general subjects which will make him a better and a happier artisan, while extending fundamental education among a number of boys will usually be found to enlarge the field of selection for apprenticeship.



The "conversazione"; a valuable factor in part-time education

A third reason for a greater interest in education is to be found in the present low quality of the product of the schools. Industry is entitled to expect a standard of honesty, cleanliness, initiative and reliability as well as reasonable scholastic attainments, but these expectations are not always realised

and consequently industry's opportunity in education begins at this level.

The idea of part-time education is, of course, old. The Fisher Act of 1918, with the one brilliant exception at Rugby, failed to secure universal continued education after school-leaving, notwithstanding a wide recognition of the advantages to be gained and, after a short period of political ferment, the subject was allowed to lapse in the mind of the general public for over two decades.

Not all the blame for the loss of this opportunity to achieve a great national advance can be placed at the door of industry; parents were obstructive and the educationist was not without responsibility in his lack of practical approach, and in his failure to convince the community on a subject on which he should have been more informed than any other class. Nevertheless, industry did make a great blunder, and we deplore much in British industrial life to-day which would have been prevented by a generous acceptance of Fisher's proposals.

Laboratory with model exhibits; part-time education is not all reading, writing and arithmetic

The outlook to-day is very different. The life-long nature of education is now widely appreciated and in the national interest the desirability of securing continued contact between youth and education after formal full-time schooling has come to an end, is generally accepted. The idea of a fusion period during which the boy or girl, instead of dropping suddenly all education on going into industry is encouraged to pass gradually from school to adult employment through part-time day release is now established. Pioneer work is being carried out by many employers in advance of the Government proposals. In 1938 more than 40,000 young people were being released during working hours for education, and although this represented only 2 per cent. of the two million employed, the last few years have seen many new schemes started and the percentage to-day must be growing rapidly.

Although there is widespread support of the idea of further education there are many difficulties to be overcome. At present such a scheme in most industrial concerns is nobody's job, although there is a distinct tendency to appoint education officers. Foremen also have to be convinced, for without their support nothing is possible. The boys themselves are also quite a problem; a large proportion have escaped from school at fourteen with feelings of joyous relief and shy off at any invitation to step back into the cage. When they do accept the opportunities offered, their motives introduce other difficulties. Not all boys are capable of National Certificate or even trade apprenticeship yet most feel that in these directions lie their only incentives. One of the tasks before industry then is to devise courses of educational activity for the 80 per cent. or so who are neither equipped mentally, nor even required, for anything but repetitive, unskilled or semi-skilled employment.

These ideas are assembled in the light of two years' experience of the Henley part-time scheme involving about 160 boys out of twice that number employed. Longer time will be necessary to formulate definite principles but the benefit both to the individual boy and to the employer are clearly demonstrated. The solution of such problems as the correct curriculum for different ages and types, and the use and extension of existing educational facilities, will only come by careful study and long experience, but the greater the number of industrial schemes started under voluntary conditions the better shall we be prepared to operate effectively under compulsion when it comes.

Gas-Pressure Cable

IN the report received from the West Midlands Joint Electricity Authority of a jointing demonstration on the Authority's gas-pressure cable (*Electrical Review*, March 10th, p. 351), reference was made to Mr. P. M. Hollingsworth, of Callender's Wood Lane Research Station. The initials should have been "D.T."; Mr. P. M. Hollingsworth is manager of Johnson & Phillips' Paper Cable Test Department.

Load Analysis

Discussion of Mr. P. Schiller's Paper

IN opening the discussion on Mr. P. Schiller's analysis of the load on a modern electricity supply system (to which reference was made last week) at the Institution of Electrical Engineers in London, MR. W. N. C. CLINCH (Northmet) remarked that in several respects the hypothesis was somewhat questionable. For instance, reference was made to the higher level of income in the area dealt with, but what the author probably meant was a higher level of revenue. Since the author's analysis had been prepared there had been a change in that, instead of hourly, it was now the practice to take half-hourly load figures, which would alter the shape of the curves in the paper. On the question of seasonal supply, he said it was difficult always to relate temperature alone to the demand for space heating. The relative humidity and also the psychological factor must be taken account of. Then how could anyone indicate the connected load on any supply system?

There was fairly good evidence that wireless reception made a definite impression on the load curve. The author assumed that the cooker load occurred at the same time as the falling industrial load, but that was not the fact, as could be demonstrated. The potential value of the space-heating load was a very real problem which everybody in the supply industry had to face. In future the shape of the author's curves must change and the author would have to be asked to consider his deductions in the light of what was to be and not what had been.

What is the Basic Load?

MR. D. J. BOLTON (Regent Street Polytechnic) said that the deductions made from the author's method rested upon one or two rather important assumptions, in particular of what was called the basic load. One interpretation of this was that it was entirely due to certain particular loads which carried on throughout the year at a constant value. Another equally valid interpretation would be that it was made up, in part, of two or more complementary loads each of which would produce a certain amount of so-called basic effect. For example, the effect of the summer load would be merely to obscure a corresponding amount of winter load and the two together would produce the effect of a straight line. By the author's method there was no means, in this case, of discovering whether it was due to a consistent load or to one or two complementary loads. More should be measured and less left to conjecture. The appendix to the paper was particularly interesting and more should be done with what he called the method of differences, *e.g.*, plotting out for some area the average Wednesday load and the average Thursday load, one day being early closing day.

MR. C. J. O. GARRARD (G.E.C.) said that future possible development rendered it necessary to know a great deal about loads and the way they varied and it would also be necessary to co-ordinate the interconnection of various interests, such as electricity and gas. It would be interesting to know if the gas industry was doing anything to put itself on the same footing as electricity with regard to availability of data on consumption, variation of load during the day, etc. One of the most interesting parts of the paper was that which foreshadowed some difficulties if load development was not based on accurate knowledge. Space heating, for instance, was a very clean and convenient way of heating a house and from the householder's point of view might be very economical. From the supply authority's point of view in the past it had been very lucrative and a great deal had been done to develop it in many cases, but the author had shown that on the system he investigated in one particular year a cold snap had only increased the kWh sold by about 1 per cent., yet the maximum demand went up by 18 per cent.

Factors Against Higher Diversity

One of the most interesting questions was whether it is possible to develop the load and at the same time increase the load factor. This consideration had led him to try and estimate the load curve of his own house in which he used electricity extensively, except for space heating. The curve had the same general shape as the author's system load curve, but before undertakings embarked on load building campaigns they should think very carefully because people had a habit of doing the same thing at the same time as everybody else. There were also other factors liable to operate against the development of higher diversity, one being the demand for speed of operation of electrical apparatus; this might tend towards the development of peaks again.

MR. J. I. BERNARD (E.D.A.) said he had been asked by Mr. Clinch to say that the two points made by Mr. Bolton (half-hourly readings and leaving out the kWh used on works) would be adopted in future. If the paper had been confined to a clear exposition of the methods that could be adopted in an

analysis of load curves, it would have been more helpful and would not have laid such stress on the conclusions given in the paper, more particularly with regard to the characteristics of different types of load, which related to pre-war conditions and might vary very much in the future. To make assumptions of the load due to water heating at different times of the day seemed a little rash without very full details of the sizes of the heaters and the manner of use.

MR. G. O. MCLEAN (Edmundsons) emphasised that this analysis applied to one particular undertaking only and he drew attention to the danger of applying the results to the general case. He felt that the ordinary methods of comparing one, two, or three chosen pairs of daily load curves would give results comparable with the author's, whose load model was out of date. The contour plan was much easier to draw and carry about than a solid model.

MR. B. WOOD said statistics showed that cold snaps occurred at about 10- or 11-year periods, which fact might be taken into account in preparing for sudden loads.

MR. E. A. LOGAN (Erith) said the paper seemed to suggest that the space heating load was not remunerative; he felt that this apparent conclusion to be drawn from the paper was erroneous.

MR. E. E. JOLLY remarked that the paper suggested that the space heating tariff should be below the lighting tariff. In the early days, tariffs were more or less scientific and it was justifiable to charge more for lighting than for power. Now the tariff was what could be obtained for a particular class of load which, in his view, was wrong. With a suitable tariff he had great hope for space heating in post-war years.

Space-heating Considerations

The AUTHOR, in his reply, said it would have been impossible to take into consideration all the factors concerning space heating, but the curves proved that its trend was more in direct proportionality between temperature and demand. Space-heating saturation was extremely difficult to estimate because no records were available, but something could be done by taking sample areas where the connected load could be ascertained by inspection. Such investigations were being carried out. The Gallup poll method was being studied within E.R.A. and it might lead to mass data being obtained on the basis of limited samples. It was intended to issue another report at some future date dealing with the method as improved, perhaps, by others, in a condensed and general form. The load factor of the industrial load appeared to be higher than usually anticipated, but the figures in the paper did not include any lighting or space heating paid for at power rates, which would lower the load factor. There was no claim that the load model he had prepared was new, but he found it extremely useful and preferable to load contours. Cold snap cycles could not be relied upon. There were serious cold snaps in 1938 and 1940 and again in 1942, which broke the law suggested. The significance of load factor and other quantities as regarded their economic effects would have to be studied in greater detail. The paper was not intended to deal with tariffs, which were not the concern of E.R.A.

Reorganisation

I.M.E.A. Decisions

WE have received the following official report from the I.M.E.A. of the meeting held last week to consider memoranda on the reorganisation of the electricity supply industry:—

An extraordinary general meeting of the Incorporated Municipal Electrical Association was held at the Central Hall, Westminster, on March 16th. The meeting was very well attended, a large number of delegates together with additional representatives, being present. The meeting displayed great enthusiasm with regard to post-war reconstruction, and two reports were before the meeting.

The Joint Report, generally known as the "White" Memorandum, was subjected to an amendment which was eventually carried referring this back for certain modifications to Part III.

The I.M.E.A. independent report, known as the "Brown" Report, on ownership of distribution undertakings, generating stations, and a national standard bulk supply tariff was accepted.

It will now be necessary for the Association to discuss with the other interested parties, a revision of the "White" Memorandum, and take such further action as may be necessary to bring before the Minister of Fuel and Power their recommendations embodied in the "Brown" Memorandum.

The Joint Report is that prepared by the I.M.E.A., the Provincial Electric Supply Association, the London Electricity Supply Association and "a group of power companies, members of the Incorporated Association of Electric Power Companies." Part III, referred to above, is the section dealing with the future organisation of the industry and the recommendations made include the appointment of an Advisory Committee to divide the country into suitable areas in each of which there would be an Area Committee which would be responsible for co-ordination and development in the area. It is proposed that the purchase rights of local authorities should be suspended pending the formation of the Area Committees and that their exercise should then depend on the Committee's recommendations.

Electric Signalling

System Operated on the London Underground Railway

HOW power signalling has developed on the London Underground railway system is described in a paper by MR. R. DELL (L.P.T.B.) submitted to the Measurements Section of the I.E.E.

The system now covers 160 miles of double track with 3,281 stop signals, 2,726 of which are fitted with train stops ; also 4,347 track circuits and 1,326 pairs of points. Although automatic signals are installed wherever possible, 112 cabins remain in use at junctions and connections in the track lay-out.

While the original DC method of actuation was remarkably satisfactory, to render the track circuits entirely immune from interference by stray currents from the DC 600-V traction system has involved progressive replacement by AC equipment, with many additional safeguards. The simplicity of the electro-pneumatic apparatus, which has been retained, has proved very advantageous; the maintenance it requires is considerably less than for all-electric gear, while the smaller weight of the equipment enables it to be more easily serviced and it is more reliable.

The bulk of the electrical apparatus is installed in relay rooms built at the end of station platforms to facilitate attention. A special feature is that each of the most important track circuits (berth) has two track relays with their windings in series ; one of them is a track relay proper while the other, by switching its local winding over the appropriate contacts, functions as a signal relay. This introduces an additional safeguard, since both relays must be energised for the signal to show a clear way.

Advantages of Fourth Rail

At first sight the employment of a fourth rail for the traction return circuit may seem extravagant, when compared with the use of the running rail for the dual purpose of a return for the signalling circuits. In fact, careful calculations have shown that when allowance is made for a frequent service of trains the additional cost of the signalling is more than the saving made on the fourth rail. The losses are also less with the fourth rail system which, apart from cost, makes signalling very much simpler in design, less susceptible to maladjustment and easier to operate.

The condenser-feed type of track circuit has been standardised and proved extremely satisfactory in service, with condenser tappings and link connectors to permit adjustment of the capacity of the circuits. The relays, which must be absolutely reliable and not operable by DC, are of an improved two-element vane pattern. Development of a new twin-vane type has not yet progressed beyond the stage of a single experimental model. For remotely controlled signalling a special point-control relay has been designed with a single vane movement carrying two sets of contacts so arranged that they are held closed by gravity in either of its two positions.

Separate 600-V and compressed-air lines are provided on each side of a double track, feeding the signalling for north-bound and south-bound roads from different sources ; the transformers have link connectors so that every tap is a point at which isolation can be carried out. Looped feeders are a safeguard against reversal of phase resulting from switching at feeding points. Compressed air is piped throughout from compressors in the substations. The pipes afford convenient support for signalling cables, which are lead sheathed. Special precautions taken to protect them from stray currents, in effect, gives the signalling installation its own " private " earth system.

Screening Methods

With multi-core cable without an earth screen between individual conductors, insulation breakdown could easily cause faulty operation. Consequently all the Board's later signalling installations have employed individual two-cored cables, their lead sheathing providing an earth screen for fuse-blowing purposes. But this is not the only way of providing screening between circuits and when the time is more suitable it may be possible to produce a multi-core cable, which has the advantage of cheapness, designed according to suggestions illustrated in the paper.

By providing relay interlocking with remote control operated from an adjacent signal cabin about half a mile away, all cabins need not normally be manned. It is believed that the combination of route control with relay interlocking has considerably helped signalmen to deal with a close service of trains, but interlocking causes much more circuit complication than individual lever signalling. In an endeavour to ease the situation a new arrangement of remote control (evolved just before the outbreak of war) has been applied to one small cabin while another has been constructed but is not yet in service. The new system is particularly adapted to the control of signalling remotely from a distant cabin or, alternatively, to the control of a large lay-out from a central cabin, allowing the signalling equipment to be broken up into several small units.

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.

I.M.E.A. Selected Station Owners

AS you are aware, a meeting of members of the I.M.E.A. was held at the Central Hall, Westminster, to consider the White Joint Memorandum on Distribution, and the Brown I.M.E.A. Memorandum on ownership of distribution undertakings, ownership of generating stations, and national bulk supply tariff. My personal impressions of this meeting, which I attended in company with my chairman, and also my views upon the whole subject after careful and long study might perhaps be interesting and helpful to your readers, particularly those who are I.M.E.A. members; but on the other hand they may be considered not so good.

I may say at the outset that I am not enthusiastic about "post-war planning." I admit that a certain amount is necessary in certain spheres, but "post-war planning" is seized on by a large body of people as something they must be busy with during the war, and the majority of schemes of this nature are uncalled for and are "cluttering up" the war effort directly and indirectly. The Government may take a different view and treat it as keeping a lot of mischievous busybodies out of worse mischief. My belief is that the majority of "post-war planners" are of the same type as those who did not plan pre-war. Had the same keenness been shown from 1930 onwards there would have been no war.

I could see running through the proceedings at the meeting the same errors which blinded people in the nine years preceding the war; that is to say, they were willing to cart away the ruins if they couldn't have their political prejudices satisfied. The meeting was held to determine the best and most efficient method of electricity development and not to foster political beliefs. During the last twenty years the main reduction of electricity costs has been due to technical brains in respect of the wonderful developments in efficiency of plant, and as a result an almost equal economy has resulted from the large units of plant, lowering the cost per kilowatt. The progress attributed to the Central Electricity Board has been very much exaggerated.

The advantages put forward for the transfer of generating stations to the Central Electricity Board are largely padding and platitudes, which in the main would have no realisation in fact if the transfer were made. I am open to conviction however, if as a result of a thorough technical investigation favourable and convincing arguments could be put forward. I am not satisfied with the constitution and structure of the I.M.E.A. Surely, the matters voted upon were the concern only of local authorities and should only be voted upon by local authority members, after taking technical advice from their engineers. As it was, half the voting power was held by engineers. It seems to me that engineers exercising their free will in voting was wrong and if they were instructed to vote a certain way by their authority it was also wrong.

I am also in disagreement with the constitution of the I.M.E.A. as regards voting power. At present each undertaking has two votes and the following statistics compiled from the Electricity Commissioners' Returns for the year ended March, 1938 (the latest available), will show the absurdity of the voting:—

> The ten largest I.M.E.A. "selected station" undertakings include in their area of supply 25·3 per cent. of the total population receiving electricity from members of the I.M.E.A.; or the forty-five largest I.M.E.A. "selected station" undertakings are responsible for the supplies of electricity to 50·3 per cent. of the population receiving electricity from I.M.E.A. members, although these forty-five members, out of a total of 336 members, only have 13·4 per cent. of the voting power; or the 93 I.M.E.A. "selected station" undertakings supply electricity to 64·5 per cent. of the population supplied by the I.M.E.A. in total; they supply 70·1 per cent. of the electricity used for lighting, heating and cooking, and 74·7 per cent. of the total supplies of electricity given by I.M.E.A. members, *but they only have* 27·7 *per cent. of the voting power.*"

If the present day figures were available, the percentages of output in favour of the "selected station owner" members of the I.M.E.A. would be accentuated.

The result of the voting on the present basis means that a small percentage of electricity supply authorities, reckoned in units sold or population served, have magnanimously recommended that the generating stations of the greater majority, based on the same interests, should be handed over to a central authority without any other effective reason than the hope that it would make electricity cheaper for them in the form of a national standard bulk supply tariff.

If it comes to pass, I hope that it will not have similar results in operation to another centrally controlled commodity which has been upsetting the financial stability of the electricity supply industry for some time

back. Like the story of the Aberdonians who protested against a decrease in the tram fares because they could not save so much by walking, it looks as though in travelling down the path of further thermal efficiency savings we will be able to save much more than we have done in the past, if the price of fuel goes much higher.

Sheffield. JOHN R. STRUTHERS.
General Manager,
Corporation Electricity Department.

Criticisms of I.M.E.A. Memorandum

THE result of the I.M.E.A. extraordinary general meeting in London last week is significant and may be taken as a pointer to the growing conviction, both within and without the industry, that there is a substantial opinion dissatisfied with the methods used by the various Associations within the industry in respect of reorganisation. Surely the time has gone to attempt to combine local authorities and company undertakings, or to continue the two types of undertaking.

The adoption of three fundamental principles is overdue, *viz.* :—1. The extensive supply of electricity throughout Great Britain is an essential national requirement. 2. The consideration and needs of consumers must be the first and foremost obligation of the industry. 3. The administration and development of the industry must be such as to ensure the lowest possible charges for electricity.

As electricity supply is of paramount importance to the industrial, trade and domestic life of the country, every means must be used to make it obligatory upon undertakings to offer every practical facility to enable consumers to make the fullest possible use of the service. It follows that money must be available for developments at a low rate of interest. Investments in electricity supply must be regarded as gilt-edged securities.

Individual municipal control must give way to public control over large areas. If individual company control is allowed to continue, the interest on capital, and depreciation and reserve funds, must not exceed by more than, say, 1 per cent. the interest and sinking fund charges of publicly-controlled undertakings.

No one will wish to belittle the work of the I.M.E.A. Council in producing its "White" Memorandum, but it is considered in many quarters to be a disappointing document and, by some, that it is impracticable to combine two unmixable interests and give consumers the best service.

While the Memorandum refers to the progress and good services rendered to consumers by the industry as a whole, it does not mention the important services which have been neglected and the injury and loss the consumers and industry have suffered thereby. Nor does it refer to the fact that much of the progress has arisen from the inherent good in electricity and in spite of the limited activities of many local authority and company undertakings. The Memorandum does not give definite assurance to consumers that the omissions in the past will be remedied in future.

The Memorandum does not demand immediate strong legislation to put supply authorities under an obligation to supply at standard voltage and uniform tariffs; provide showrooms, apparatus, installations, and free meters; and underground and overhead electric lines to premises within a specified distance, without cost, and extend distribution lines throughout the length and breadth of the country where there are potential demands which would be remunerative within a period of from three to five years. Any suggestion of subsidising or otherwise assisting in the cost of change-over from DC to AC and providing electric lines in rural areas from funds outside the industry should be deprecated. Since about 1930 the benefits of change-over and rural supplies have been established; such works do not contain unknown conditions which the industry cannot cope with.

There is no public utility service which is more capable of being entirely self supporting and it would be a lasting reproach to the electricity supply industry if any section were subsidised from outside the industry. Part 3, paragraph 50, of the I.M.E.A. Memorandum, "Duties of Area Committees," gives examples of the weakness of the proposals, *e.g.*, (*f*) To investigate the need for supplies to rural areas, etc.; (*l*) To encourage the establishment of central depots, etc.; (*m*) To encourage the establishment of central purchasing, etc.; and (*n*) To foster, in conjunction with, etc.

Whatever body is set up its duties must be more downright, and not merely to investigate, to encourage, to foster, etc. Statutory electricity supply authorities should be under obligation to do these things. In general, the proposals show a lack of daring and enterprise and are some twenty-five years behind the times. Before the Memorandum is sent to the Ministry it should be drastically amended and go right out for the distribution of electricity on an area basis under public control, with definite obligations to serve consumers with electricity and apparatus for every practical purpose.

Chester. S. E. BRITTON.

Domestic Apparatus

THE articles which have appeared during recent weeks on domestic apparatus are very interesting and give much food for thought in planning for post-war requirements.

We were interested to note the suggestion

in your issue dated March 3rd that a small saucepan might be used as an auxiliary to an electric kettle and the enclosed illustration taken from our current catalogue is of such a combined kettle and saucepan which we introduced about fifteen years ago and regularly marketed until 1941 when restrictions made it impossible to produce it.

In the March 17th issue your article rightly points out the admitted advantages of the immersion element in kettles, of which we were pioneers, and that the introduction of immersion elements was responsible for larger lids—due to the fact that an immersion element has to be inserted through the lid opening. There is much to be said for large lid openings, as they facilitate the cleaning of the inside of the kettle, especially in hard water areas where lime deposit has to be removed periodically. A kettle without a lid and with a large spout for filling is no novelty for use on a gas or coal fire, but is not ideal for a kettle fitted with an immersion element.

Birmingham. BULPITT & SONS, LTD.
L. E. FRASER,
Sales Manager.

Coal Conservation

I HAVE read with great interest the articles and correspondence in the *Electrical Review* on post-war electrically-equipped houses, but it does appear to me that the long-distance policy has not been fully investigated.

In this country, coal is one of our most important natural fuels and in view of the growing difficulty in extracting it as seams become non-productive, the tendency will be towards ever-increasing prices and possibly reduction in output. The best use of coal must therefore be made, perhaps even at the expense of some personal comfort.

In gas manufacture, somewhere in the region of 130 to 185 therms can be obtained per ton of coal, depending on whether the dual or single process of manufacture is undertaken. The equivalent electrical energy produced at a steam station is approximately 80 therms. It does not seem a wise policy to assume that the gas industry has no field of application for domestic purposes, for it most definitely has application in boilers for central heating and boiling plates on cookers. A certain prejudice even still exists for gas ovens.

Gas should still be considered as a very lively competitor in certain domestic appliances and the electrical manufacturers should make their products outstrip the advantages so long claimed by the gas appliance manufacturers. No electric cooker should be made without at least thermostatically controlled ovens and hot plates, so that any range of intermediate temperature from simmering heat to boiling can be obtained and at the same time economy in the use of fuel be achieved.

It also seems necessary to have close collaboration with the Government policy of conservation of fuel to ascertain whether at some more future date we may not be faced with the zoning of the type of fuel or energy to be used in various districts for heating. Such zoning was seriously considered and I believe put into practice in certain areas in Germany in pre-war days.

The object of these remarks is not to disparage the efforts of the electrical industry in the domestic field; it is obvious that in certain applications it stands supreme, but the long-distance view may be worthy of thought so that the best advantage accrues from the work of planners and designers with the aim of conserving fuel, even in the post-war period.

Farnham Royal. W. M. CRAIG,
B.Sc. (Eng.), A.M.I.E.E., A.M.I.Mech.E.

From Group Capt. J. A. Cecil Wright, M.P.

Administrative Training

ADDRESSING the House of Lords in December, Lord Woolton voiced his conviction that our great industrialists would recognise their opportunity to rebuild the country when peace returns. In my own constituency of Erdington an unusual training scheme which has just been announced comes as practical evidence that Lord Woolton's faith was well-founded. They have already set up at Fort Dunlop an organisation to select for administrative or supervisory posts men and women returning from service in the Forces or Government Departments. Individual aptitudes are to be noted and their possessors posted for specialised training in accordance with them.

Such a plan, if generally adopted, would be as advantageous to industry as a whole as to the men and women who would immediately benefit. Lord Woolton hoped that our great industrial organisations would take up the challenge of the future. We in Erdington have given a lead in this matter which I would, with respect, commend to industrialists elsewhere.

Birmingham. J. A. CECIL WRIGHT.

Post-War Lighting

MR. SHAPLEY, the public lighting engineer of Leeds, in your issue of March 10th asks if manufacturers have any new suggestions to offer in street lighting as part of their post-war policy.

Pre-war street lighting was not designed for conditions of poor visibility and any post-war scheme for the illumination of important streets and main traffic arteries should take this factor into account. Low intensity kerb and traffic lane illumination would prove invaluable under foggy contions.

Sutton Coldfield. F. POOLE.

PERSONAL and SOCIAL

News of Men and Women of the Industry

NORWICH City Council has decided that the salary of the city electrical engineer, **Mr. J. A. Sumner,** shall be increased by £100 during the year commencing April 1st, 1944.

Mr. Howard Marryat, M.I.E.E., M.I.Mech.E., gave the "Friday Afternoon Discourse" to the Royal Institution, London, on March 17th, his lecture being devoted to the evolution of watchmaking, based on, and illustrated by, his own collection of historic watches. It may not be very widely known that Mr. Marryat's assembly of watches is regarded as one of the finest collections of such timepieces in private hands in this country, and one hundred or more specimens were shown at the Royal Institution in support of his remarks.

Mr. J. Eerdmans, managing director of De La Rue Insulation, Ltd., and also a director of De La Rue Plastics, Ltd., has been appointed sales director for both companies. This means that the entire sales of the plastic products of the two companies at home and abroad will be under his control. **Mr. F. G. Cooke,** who was general technical manager of De La Rue Insulation has been appointed chief of the Development Division of De La Rue Plastics and its subsidiary companies, both in the United Kingdom and overseas. **Mr. R. B. Harley,** as chief chemist, will control the whole of the chemical research.

Mr. John Perry, an engineering apprentice at the Stafford works of the English Electric Co., Ltd., was selected recently to be the first holder of the Milligan Shield. This shield, given by Mr. J. W. C. Milligan, manager of the Stafford works, is to be competed for annually by the trade and engineering apprentices of the works, the holder each year being chosen jointly by the apprentices and the management. In handing over the shield Mr. Milligan said that his aim was to encourage and recognise ability at studies, workshop training and public spiritedness. The presentation was made informally at the works in the presence of senior officials of the company and representatives of the Apprentices' Association. As a permanent reminder of the occasion Mr. Perry received a small silver replica.

Mr. R. H. Howatt, formerly manager of the Birmingham office of the Brush Electrical Engineering Co., Ltd., has been promoted to an executive appointment at the head office and works of the Brush Organisation at Loughborough. **Mr. E. Leslie Brooks,** A.M.I.Mech.E., A.I.E.E., chief technical sales engineer of Petters, Ltd., a subsidiary of the company, has been appointed manager of the Birmingham office of the Brush Electrical Engineering Co., Ltd.

Mr. F. E. C. Miller has been elected a director of the Edison Swan Electric Co., Ltd. Mr. Miller has completed over twenty years' service with the company during which time he has held the positions of London manager and manager of the lamp department.

Dr. W. T. Griffiths has been elected president of the Institute of Metals for 1944-45 in succession to Lieut.-Col. Sir John Greenly, K.C.M.G. At the annual meeting of the Institute last week it was announced that **Mr. C. Shaw Scott,** who has served the Institute as secretary since its foundation in 1908 and as editor for 30 years, is to retire next June on reaching the age of sixty. At the same meeting the Institute Platinum Medal for 1944 was presented to **Lieut.-Col. R. M. Preston,** D.S.O.

Obituary

Mr. H. Lingard.—Many of our readers, especially those in the lighting business, will be very sorry to hear of the death on March 12th of Mr. Harold Lingard, manager of the London Lighting Service Bureau, at the early age of forty. Mr. Lingard had been associated with the Bureau since its inception; after some years as chief of the Engineering Department and as deputy manager, he was appointed manager in 1939. Shortly after the commencement of the war he went to the Ministry of Supply as principal lighting and power officer, and for his services was awarded the M.B.E. last year.

The late Mr. H. Lingard

Although Mr. Lingard was fully occupied with his work at the Ministry he managed to keep in close touch with his associates in the industry and during recent months he had found time to take an active part in the preparation of the Bureau's post-war plans.

He leaves a wife and three young children to whom we extend our deepest sympathy. The photograph reproduced is one which we took at the 1939 E.C.A. conference.

Mr. R. F. Ferguson.—The death occurred recently at Salisbury of Mr. Russell Forrester Ferguson, M.I.E.E., M.I.Mech.E., who was formerly borough electrical engineer of Hastings and in 1925 designed and supervised the building of the power station at Broomgrove.

Mr. H. G. Spicer.—The death occurred on March 11th, at Sawston, Cambs., of Mr. Henry Gage Spicer, J.P., chairman of Spicers, Ltd., paper makers and manufacturers of insulating materials. He was sixty-eight. Mr. Spicer was appointed a director of the family business of Spicer Bros., Ltd., in 1898, became managing director in 1912, and both chairman and managing director in 1920. He retired from the chairmanship in 1922 on the amalgamation of the company with James Spicer & Sons, Ltd., but was again appointed chairman in 1923. He relinquished the post of managing director in 1939.

Will.—**The late Sir James Fortescue Flannery,** Bt., chairman of Callender's Cable & Construction Co., Ltd., left estate valued at £419,160 (net personalty £372,928).

I.E.E. Luncheon

Views on the Formation of Local Groups

THERE was an attendance of 220 members and guests last week at an informal luncheon of the Transmission Section of the Institution of Electrical Engineers. MR. T. R. SCOTT, chairman of the Section, presided.

COL. SIR A. STANLEY ANGWIN, President of the Institution, remarked that the Transmission Section now had a membership of 1,738. The mere size of the more popular meetings and number of speakers who wished to take part in discussions often caused chairmen to experience difficulty in closing meetings on time. Papers were often stimulating and, rightly, sometimes provocative, but he expressed the opinion that information of most value was usually imparted during the discussions.

The solution of that problem might be in the establishment of more groups of the several technical Sections at the various local Centres, as the Wireless Section had already done. Members could then make their contributions to the local discussions and avoid the inconvenience of travelling to London for the main meetings. The Institution would like more space in the *I.E.E. Journal* to be devoted to the reporting of discussions, though the matter might have to remain in abeyance until after the war. The primary function of the I.E.E. was to obtain the maximum concerted expression of opinion.

MR. T. E. GOLDUP, chairman of the Wireless Section, was of the opinion that sectionalisation and group formation was apt to encourage specialisation in particular spheres, with consequent neglect of other fields within the profession. So one should avoid becoming too engrossed in any one Section; combined meetings and joint papers served very useful purposes.

The Wireless Section was entering upon the twenty-fifth anniversary of its formation this year and its membership had become so scattered that, in order to maintain interest, local groups had had to be formed at provincial Centres. He was sure that other Sections would likewise benefit from local group formation, but a multiplicity of Sections would confront the Institution with difficult problems. It would be very unwise to allow sectionalisation to increase to the extent of causing Section members to lose interest in the work of the I.E.E. as a whole, or as a body to which they all belonged by virtue of the same basic training in engineering required of them all.

MR. E. W. MOSS proposed the health of the chairman.

South African Notes

Cape Town Rate Contributions

CAPE TOWN City Council has decided to abandon its proposal to make a surcharge of 5 per cent. on electricity accounts, states the *South African Engineer and Electrical Review*. Instead it is to reduce the amount for depreciation from £98,000 to £58,000 and thus obtain an extra contribution of £40,000 from the Electricity Department towards the relief of the city rates. At a public meeting held to protest against the proposed surcharge it was stated that in the past four years electricity consumers had contributed £600,000 to the rates. The city treasurer considers that it would be wiser to devote electricity profits to reserve to meet future heavy calls for extensive capital developments. At present the reserve is only £98,000 and it is considered that it should be at least £415,000.

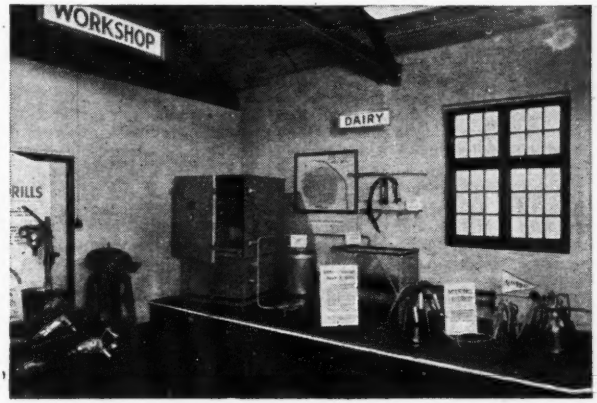
The Table Bay Station.—The existing Table Bay power station in Cape Town was started in 1935 and first came into service in 1939 with three-fifths of the total generating capacity originally planned. It was decided some time ago to complete the remaining two-fifths as soon as possible, but at present this is impossible due to difficulty in getting the necessary machinery from England. Representations have been made to the responsible committee in England and it is hoped that the necessary plant will be released at the earliest possible date. The whole scheme was estimated to cost £3,350,000, of which in 1935 £1,850,000 was raised to pay for the first part of the plant. When the final two 40,000-kW turbo-alternators are installed the station will have a total capacity of 200,000 kW. The present building will have to be extended to take the new machines. No further extensions will then be made to this power station and when there is ultimately a need for more power in Cape Town a larger power station will probably be built in a new situation. Since the new harbour was completed a giant aqueduct capable of supplying a power station twice the size of that at Salt River has been incorporated in the outer mole. It is thus possible that this power station of the Electricity Supply Commission will be extended considerably. Had the seawater intake system at that point been as satisfactory in 1935 it is possible that the new Cape Town power station would have been built at Salt River instead of in Dock Road.

Increased Consumption in Durban. — In the year ended July 31st last, the total quantity of electricity consumed in Durban was 242,471,880 kWh, an increase of 2·5 per cent. over the previous year. There were increases under every head except tramways and street lighting (there was a total black-out). Consumption by Government Departments rose by 35 per cent.

Showroom for Farmers

Norwich Department's Enterprise

TO assist the war effort and to meet the needs of farmers in Norfolk and the surroundings the Norwich Corporation Electricity Department installed an electric grinder and gave illustrations of other equipment at the Consumers' Advice Bureau which it recently opened (*Electrical Review*, February 18th). It was found, however, that while the Bureau was adequate for dealing with inquiries about terms of supply, etc., additional room devoted solely to agricultural purposes was needed so that the technical aspects of farming equipment could be demonstrated on the actual machinery. Therefore, on March 10th an agricultural showroom was opened at the head office in Duke Street, accommodation being provided by equipping a disused office with some stands from old exhibitions. Since the premises were opened, a number of prominent farmers and agriculturalists have visited the showroom and have expressed keen interest in it. A suggestion has already been made that a stall should be taken in the Cattle Market so as to bring the benefits of electrical application into still more prominence and this is being followed up, for it is evident that the Electricity Department is gaining the goodwill of the farming community.



The dairy section of the Norwich Agricultural Showroom

The new agricultural showroom is divided into a number of sections. That for dairy equipment comprises a sterilising chest, steaming jets for milking clusters, and a steam injector for heating water in a wash trough. There are two or three milk units of various types on show and it is hoped to install a further sterilising boiler equipment in a short while.

The horticultural stand has a garden frame in which has been installed a thermostatically controlled soil heating cable. It may be remembered that Norwich Electricity Department did some pioneer work on this subject in conjunction with the E.R.A. There are two wheel-barrow equipments on view, one a portable spraying pump and the other a circulating pump suitable for dealing with liquid manure, raising water from sumps, etc. Finally, an electric lawn mower and also a hedge clipper have been included.

In the Department's area a great deal of development in the grinding load has taken place and considerable interest has been aroused amongst large and small farmers. An automatic "Essex" mill installation, complete with grain hopper and storage bin, has been built up in the showroom and practical demonstrations can be given. For those who prefer a larger equipment there is a "Britton" grinding mill complete with piping, cyclone and sacking-off cylinder. There is some demand in Norfolk for co-operative working between farmers in the provision of certain equipment. For those farmers who wish to combine with their neighbours in the grinding of their cereals, a portable "Essex" mill with cyclone for sacking off has been mounted on a four-wheel truck and this equipment is available for inspection.

In the reclamation of land in this area a number of electrically operated large pumping installations have been constructed and supplied from the Corporation's system. This does not cover all the water pumping applications on the land, for one of the farmer's most vital needs is for water for his stock and premises. Consequently a pumping section has been included at the showroom and here there is a shallow-well domestic pump, a small centrifugal domestic equipment, and a power head for operating a deep-well pump. This is mounted on a well section to show its application more clearly, and with the same idea in mind a small piston pump, complete with stand, tanks, float gear, etc., has been set up to demonstrate automatic operation. A "Reduxo" and a "Devonia" gear unit have each been exhibited to show their use in operating existing hand pumps. All the foregoing equipment is naturally of the electrically operated type.

Deliveries of material have hampered the completion of the poultry section, but this will eventually include an electric incubator, a hover and two portable egg testers. Various miscellaneous items have been distributed around the showroom, and these include items like a sheep shearer and a cattle clipper.

In catering for the agricultural community

the needs of the blacksmith must not be overlooked. In modern times his method of work has changed and many have installed electric blowers to their forges. But the old-time forging is not so prevalent in the countryside nowadays, and so a static AC welding plant has been installed in the showroom. A twin-wheel, motor-operated electric grinding machine is also on view as well as an assortment of workshop tools, drilling machines, and other appliances.

It is found that there is an increasing demand for such equipment by the farmer, as well as by the local repair depot. In addition to these miscellaneous items a number of photographs are on view to show electrically operated agricultural machinery which cannot be displayed in the showroom.

Even the display of actual apparatus in a showroom may not be sufficient to give a farmer a full idea of the advantages of electrically operated equipment. As a further help the showroom is fitted with wall maps showing various situations throughout the rural area of the undertaking where electrically operated appliances are in use.

Electricity in Quarries

Criticism of Regulations

JURISDICTION over the use of electricity in quarries ceased to be exercised by the Home Office when the Factories Act, 1937, was passed. There were then issued under S.R. & O., 1938, No. 1233, Quarries General Regulations (Electricity) which have caused most operators considerable concern. They have not greatly affected large quarries which have competent staffs and sufficient resources available, but compliance has been a hardship to small concerns in interpreting the new rules and in carrying out the required routine tests.

In a paper on the subject presented to the Association of Mining Electrical and Mechanical Engineers (London branch) MR. J. PARKER states that mechanically-driven plant is being used in preference to electrical equipment, while electrically-driven excavators have been removed from sites controlled by the Quarries Regulations to open-cast coal workings. The latter have been exempt (S.R. & O., 1942, No. 2445) from regulations imposed on quarries and metalliferous mines as well as from those concerned (under the Factory Act) with electricity, which is a direct admission that the regulations hamper production. Since working conditions are identical, it seems unfair to deem the necessity for regulation to be greater in the one case than in the other.

Protective Earthing

If a quarry operator purchases energy in bulk and himself steps down the high voltage for his own use, he will have the advantage of being able to control the effective earthing (2 ohms) of the transformer neutral point. There is no similar obligation upon the supplier of electricity; nor is he required to install (above 650 V) earth-leakage protection and, moreover, he can use plain lead-sheathed and unarmoured cables, which the quarry operator must not do. The Electricity Commissioners do not compel overhead lines to be furnished with an earth wire; when provided, relative conductivity requirements are not specified. Thus different codes are applicable under identical conditions in different circumstances.

Factory Regulations allow inspectors considerable discretion, whereas the Quarries Regulations attempt to establish definite standards of safety in the form of specific values of conductance, shock voltages, earth-plate resistance and so forth, which are quite empirical. Restriction in this way of the exercise of sound judgment, based on wide experience, will irritate engineers and decrease their usefulness.

Attempts of this kind to secure precision cause confusion in respect of earthing. For instance, external bonding in accordance with Regulations 11 and 12 will in some cases render it impossible to prove whether the conductivity requirements of Reg. 9 (1) have been observed. It is complained that the six-monthly test obligation is too harsh; procedure differs so much that the Mines Department should issue a Code of Practice on testing and test records.

Comments on Cables

Regulation 26 omits to define the capability (range) of apparatus for measuring low resistance. Clause 9 (1) should allow cables already buried in the ground to remain if they pass a conductance test and appropriate protection is afforded against earth faults. Also flexible conduit should be permitted for purposes other than connecting motors on sliding bed-rails; it is difficult to suggest an effective alternative means of flexibility connecting some kinds of magnetic brakes. Clause 9 (2) is very indefinite in respect of sealing cable terminals and whether it applies to small wiring. The isolation requirements of Clause 20 are very difficult to interpret.

No attempt appears to have been made to define in a practical manner any line of demarcation between what is governed by the Quarries Regulations and what is subject to the Factory Regulations.

The paper includes descriptions of various methods of installing earth electrodes with due regard for different soil resistivity.

COMMERCE and INDUSTRY

Electrical Employment in Eire. Oldham Jubilee.

Lighting of Shops and Hotels

THE Minister of Fuel and Power has given a General Direction (Standard of Lighting) No. 2 (S.R. & O. 1944 No. 234, Stationery Office, price 1d.). This amends the General Direction (Standard of Lighting) No. 1 (S.R. & O. 1943 No. 1210) which lays down the maximum standards of illumination in shops, hotels, restaurants and places of public entertainment, sport and meeting.

The amendment provides that as from March 20th the maximum standard of lighting in any room, compartment or enclosed space shall be calculated separately, and shall not be affected by the fact that the lighting used may also incidentally illuminate some other place.

Irish Electrical Traders

At the annual meeting of the Society of Irish Electrical Traders it was stated that through the joint efforts of private enterprise in the electrical trade and State Departments more than 10,000 new premises had been wired and provided with means of utilising electricity. Employment for skilled electricians available had been maintained steadily throughout the year and prices had been kept at reasonable levels. Mr. H. H. Lauder, who presided, declared that it would be difficult to attempt a criticism of the work and co-operation which had made possible these satisfactory and encouraging results. He added that plans for post-war production were engaging the attention of Irish manufacturers of electrical materials. There was no reason to have any undue concern regarding the future.

A Coming-of-Age

With its March 11th issue the *Wireless & Electrical Trader* celebrates the twenty-first anniversary of its foundation. Birthday greetings from leading radio personalities are published and a review of the radio industry's career during the past twenty-one years is commenced, to be completed in the March 25th issue. It is interesting to be reminded of the early days of a business which in so short a space has attained such a magnitude.

Enamelled Wires

A new grade of enamelled wire has been introduced into B.S.156, a revision of which has been published. This new grade has a heavier coating of enamel, so the original and new grades are now designated "normal covering" and "thick covering" respectively, the latter being sometimes referred to in the trade as "double enamelled wire." The requirements for the grade with normal covering are the same as those specified in the 1936 edition of B.S.156 except for slight modifications to the overall diameters in order to bring them into line with modern practice in manufacture. A few additional sizes have also been added. The specification defines the quality of the copper, the thicknesses of enamel, and the limits of resistance. Electrical and chemical tests are included. Copies of the revised standard may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. post free.

The Importance of Research

In an address on the training of research workers at Manchester last week, Dr. A. P. M. Fleming, director of research and education, Metropolitan-Vickers Electrical Co., Ltd., said that probably industrial research, if properly used, would be the greatest insurance this country could have against unemployment. The graduate who sought to become an industrial research worker should obtain suitable experience in the industry in which he wanted to make his future career. Each small company should have at least one technically trained officer able to make effective all the appropriate new knowledge provided, for example, by the research association of the industry concerned. Thus it would be possible for the research association to assist not only in training men for such positions but in keeping firms in touch with scientific developments by consultations.

"Health and Welfare" Exhibition

To inaugurate the opening of a completely new building for welfare work Connollys (Blackley), Ltd., have this week been holding a health and welfare exhibition. Every lunch-time throughout the week there have been short talks or a film show in the canteen on health matters, and in addition films lent by the Ministry of Information have been shown on certain nights. The Works First Aid Section has been giving practical outdoor demonstrations on the methods of dealing with casualties. The exhibition itself has been divided into sections dealing with general health, accident prevention, pre-natal advice, bacteria and sepsis, and food. An advice bureau deals with all questions connected with health and welfare, and facilities have been provided for testing blood of prospective donors.

Oldham Jubilee Celebration

Half a century of development and public service by the Oldham Corporation Electricity Department was celebrated last week at a jubilee dinner.

Proposing the toast of "The Electricity Undertaking, 1894-1944," the chairman of the Electricity Committee (Councillor F. Kenyon) said that when the Committee was first formed in 1890, permission to borrow £25,000 for 25 years was secured. Electricity was first switched on from Rhodes Bank station on March 15th, 1894, by Miss Annie Smith, daughter of the then Mayor. The selling price was 6d. per kWh. To meet the increasing demand the Greenhill site was developed and loans were sanctioned totalling £150,000. Progress was maintained and since 1906 the Department had recorded successive yearly profits.

About 1905 there was heard the first demand

for electricity for cotton mills but it was not until 1914 that the Belgrave mill, the first in the town, began operating by electricity. Extensions at Greenhill costing £260,000 followed. In spite of bad trade looming ahead, by 1922 consumers numbered 5,000 and sales were 22¼ million kWh. Out-districts were first supplied in 1923 and by 1925 the price per kWh was 1·3d. The Chadderton station was planned with 37,500 kW capacity and with the arrival of the grid scheme it became a selected station.

Regarding the future, Councillor Kenyon said a long-term policy would have to be visualised. There were tendencies towards elimination of local control but he thought that the record of Oldham in reference to electricity warranted unstinted appreciation.

In proposing the toast of " Guests " Alderman H. Shepherd, vice-chairman of the Committee, welcomed among others, Mr. F. L. Ogden, who retired from the position of borough electrical engineer in 1941, being succeeded by the present joint chief engineers and managers, Mr. R. G. Whitehead and Mr. E. Binns. The chairman also welcomed Sir William and Lady Chamberlain, Mr. H. G. Bell (C.E.B.), Mr. S. B. Donkin and Mr. R. W. Mountain (Kennedy & Donkin) and Mr. J. H. Lumsden (Stalybridge Board). Replying, Sir William Chamberlain said that the undertaking had a great future. Mr. Donkin added his congratulations and spoke of the proposals now being put forward for future development. The Mayor (Alderman Roberts) proposed " The Undertaking and its Future Prosperity," and Councillor Potts replied.

Mechanised Mining

Mr. R. Neill, Assistant Production Director, Ministry of Fuel and Power, gave a paper and film display on " Mechanised Mining " to the West of Scotland Branch of the Association of Mining Electrical and Mechanical Engineers at the Royal Technical College, Glasgow, on March 11th. Mr. Neill gave a summary of American methods and brief descriptions of American machines, and also dealt with British longwall loading machines. He explained that while the pioneer work had been done by America, some British types were showing distinct promise. At one British colliery over a face of 240 yd. in a 3 ft. 6in. seam an undercut of 7 ft. was being stripped daily by two Shelton loaders, loading 530 tons per day and 5 tons per man-shift to the main haulage.

Scottish Contractors' Year Book

We have received from the Electrical Contractors' Association of Scotland a copy of its 1944 Year Book. As usual this contains a portrait of the president (Mr. J. B. Mackenzie this year) and a full list of members, as well as contract conditions, the holidays with pay scheme, particulars of Scottish supply undertakings and other information of use to members.

Rubber-Metal Bonding

The object of an illustrated 24-page booklet entitled " Elastomeric Engineering," which has been compiled by the T. B. Andre Rubber Co., Ltd., Kingston By-pass, Surbiton, Surrey, is to present in a convenient form information about the wide scope of rubber bonded to metals in many branches of engineering. Some of the technical data tabulated and applications described represent clever recourse to advanced methods of producing and testing elastic elements of engineering structures designed to provide electrical insulation, absorb shock and vibration, insulate from sound, support loads, seal against penetration of fluids, deflect flow of gases, protect from abrasion and corrosion and transmit power, all in co-operation with Silentbloc, Ltd., which is the parent company.

E.A.W. Activities

Miss Caroline Haslett, C.B.E., Comp.I.E.E., visited Cardiff on March 9th where she attended a luncheon of the Electrical Association for Women held in her honour at the Park Hotel, Cardiff, when 40 members and their husbands were present. At the luncheon Miss Haslett was presented with a spray of orchids. At the annual general meeting of the branch held in the Institute of Engineers the president, Lady Herbert Lewis, took the chair. Miss Haslett spoke on post-war reconstruction particularly as it affects the housewife, telling of some real improvements in planning and equipment which should be available for every woman after the war.

Vapour Recovery

In Bulletin No. 28 issued by the Ministry of Fuel and Power (Efficiency Centre) advice is given on the economies possible by the use of " flash " steam and vapour recovery. Examples from several industries, illustrated with line drawings, are worked out and information is furnished on the size of the flash tank, the pumping of hot condensate, the provision of the necessary static head and the use of the pumping or lifting trap. A simple method of utilising the latent heat in vapour at atmospheric pressure by means of a spray condenser is described. The use of the flash principle for cooling process liquors and at the same time concentrating them is also discussed.

Change of Address

Higgs Motors, Ltd., are moving their London office from its temporary address at Totteridge to permanent quarters at Kingsway Corner Buildings, 109, Kingsway, London, W.C.2 (telephone: Chancery 6316-7-8).

Change of Name

Magnetex, Ltd., Harlington Works, Bath Road, Harlington, Middlesex, has changed its name to Magnatex, Ltd.

INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

HITA or ITA radio coil winding machine.

ELECTRICITY SUPPLY

Ashton Cost Comparison. Inverness-shire Ban Withdrawn.

Ashton-under-Lyne. — CLOSING DOWN OF PLANT.—Explanation was given to the Town Council recently of the reasons for the closing down of the Council's generating station. A resolution was adopted not to raise any objections to the proposals of the Central Electricity Board.

Councillor L. T. Wright, chairman of the Electricity Committee, said that the plant had been in commission since 1923 and heavy expenditure would be necessary before it could again generate. To produce electricity in Ashton cost 1·190d. per kWh in 1943, whereas they could buy from the grid at 0·594d. per kWh. Even if the Council spent some thousands of pounds, it could not generate as cheaply as they could buy from the grid. The C.E.B. would not accept the suggestion that Ashton was an admirable site for a large new station. The Board had offered, in return for the Council's giving up the right to generate, to pay the outstanding debt on the station, amounting to £3,172, and to allow the undertaking to keep the money realised on the sale of plant and other materials. Councillor Wright added that while they would have liked to generate their own electricity they did not desire narrow parochial views to obstruct efficiency.

Finchley.—NO MINIMUM CHARGE.—The Council has approved the abolition of the minimum charge for electricity supply.

Inverness-shire.—INSTALLATIONS IN COUNCIL HOUSES.—At a County Council meeting reference was made to the opposition by the Department of Health, and subsequently by the Electricity Commissioners, to the Council's proposal, agreed to some time ago, for the installation of electric lighting in its houses at Corpach. A member said that these departments had now "climbed down" after 2,000 gallons of paraffin had been imported as a lighting substitute. The Council had now been permitted to invite fresh tenders for the very work which it should have been allowed to do at the outset.

It may be recalled that, at the December meeting of the Council, it was decided to protest against the action of the Electricity Commissioners in refusing to allow electricity to be installed in the houses (*Electrical Review*, December 31st, p. 889).

Maidstone.—RATE ESTIMATES.—At the Council's annual budget meeting Mr. Gordon Larking, chairman of the Finance Committee, said that no contribution had yet been considered by the Electricity Committee so that, in effect, an additional £5,039 must be provided for as compared with the current year.

Reading.—LOSS ON UNDERTAKING.—It was reported to the Town Council at its last meeting that the operations of the Electricity Department for the year now closing were estimated to result in a loss of approximately £3,000.

Tow Law (Co. Durham).—LIGHTING SCHEME.—The Urban District Council has decided to ask the Government to allow work to proceed on a £1,400 street lighting plan.

Warrington.—RATE RELIEF.—The Electricity Committee has voted £8,000 for rate aid and hopes to be in a position to contribute a further £2,000, making a total of £10,000 for the year 1944-45.

Wednesbury.—CHANGE OVER TO ELECTRICITY.—At the monthly meeting of the Council the surveyor presented his recommendations for post-war lighting, involving a gradual change-over from gas to electricity. He asserted that electric lighting was much better and cheaper in every way.

Overseas

Brazil. — ELECTRIC POWER PROJECT. — A *Reuter's Trade Service* message from Rio de Janeiro says that the Brazilian Government's recent decision to organise a company to exploit the hydro-electric energy of cataracts in the San Francisco river between the states of Bahia and Alagoas will be a turning point in the economic life of the country. The electrical capacity of these cataracts has been estimated at 6,000,000 kW, but according to a statement made by the Minister of Agriculture at a press conference an initial capacity of only 1,000,000 kW is to be utilised. This will be sufficient to develop the main industries (magnesium and manufacturing industries) of seven Brazilian states.

Eire.—CONSUMPTION RESTRICTED.—The Electricity Supply Board recently appealed for economy in the use of electricity, stating that dry weather conditions, combined with the very grave shortage of coal, were making it very difficult for the Board to meet the demand. Subsequently restrictions were announced, coming into force on March 14th. Based on consumption in 1941 the use of electricity for water heating must be cut by 50 per cent. For cooking a consumption up to the 1941 amount is allowed, but for all other purposes except motive power, traction and public lighting there must be a reduction of 25 per cent. The penalty for non-compliance is disconnection of the supply.

France.—SEVERE RESTRICTIONS.—Drastic cuts in the supply of electricity in Paris and its suburbs were announced by Paris radio last week, states *Reuter*. Household supplies are being cut off between 8.30 and 11.30 a.m. and from 2 to 6 p.m. No electricity will be supplied to factories on March 18th, 19th and 20th.

TRANSPORT

France.—METRO STATIONS CLOSED.—The German-controlled Paris radio announced last week that 25 Metro stations in Paris were being closed down to save electricity.—*Reuter.*

Newcastle-on-Tyne.—EFFECT OF E.P.T.— Presenting the annual estimates at a meeting of the City Council, Alderman W. Thompson, of the Finance Committee, said that there would be no contribution this year from the transport undertaking to the general rates as there had been in the past. The Transport Department was a wealthy undertaking but because of E.P.T. there was an estimated deficit of £80,000. An increase in fares would, be declared, simply mean paying more E.P.T.

PARLIAMENTARY NEWS

By Our Special Reporter

Radio Sets

LAST week in the House of Commons Sir Leonard Lyle asked the President of the Board of Trade if he was aware that in many districts there was still a great shortage of radio sets and parts, and whether he could state the exact position regarding deliveries both from home manufacturers and from America.

Mr. Dalton replied that about 55,000 sets were put on the market during 1943. The number of sets already imported from the United States was about 25,000, and distribution would begin within the next week or two.

Coal for Power

Mr. Liddall asked the Minister of Fuel and Power what effect the present ash content of coal delivered to electric power stations had on transport; if he was aware that the present average ash content was double that of pre-war; where the best quality coal was being raised; and to whom it was being distributed.

Major Lloyd George said that the ash content of coal delivered to electric power stations generally had increased somewhat during the war, though nothing like to the extent suggested in the question. He was satisfied that, within the limits imposed by geographical and transport conditions, the available coal for all purposes was distributed to the best advantage for the country; and he would not feel justified in instituting special and detailed inquiries.

Cost of Electricity

Mr. De La Bere asked the Minister of Fuel and Power whether he would confer with the Ministry of War Transport and other appropriate departments with a view to ensuring that the power companies as a whole throughout the country did not increase their revenues by obtaining, *via* the coal clause, sums in excess of that required to cover the actual increase in the cost of coal; and whether he would take appropriate action to ensure a cheaper cost of electricity.

Major Lloyd George said that the operation of the coal clause was generally an integral component of the tariffs charged by electricity supply undertakings to power consumers. A scrutiny of these tariffs must wait on the reorganisation of the electricity supply industry, which was at present receiving the active consideration of the Government.

Sulzer Brothers

Replying to a question by Mr. Molson, Mr. Dingle Foot, Parliamentary Secretary to the Ministry of Economic Warfare, says that the firm of Sulzer Brothers, of Winterthur, Switzerland, was placed on the British statutory list (the " black list ") by reason of the very substantial increase during the summer of 1943 in certain of its exports, notably mercantile marine Diesel engines, to Axis countries. It was later included in the United States proclaimed list for the same reason. Since then H.M. Government and the U.S. Government have received from the Swiss Government certain assurances regarding this firm's future trade providing that the exports which led to its being listed will not recur. In face of these assurances it has been decided to remove the firm from the statutory and proclaimed lists.

Composition of Television Committee

Capt. Plugge asked the Lord President of the Council whether he was aware of the dissatisfaction caused by the fact that the Television Committee recently appointed by him was excessively representative of official interests and that progressive private enterprise had not been given a fair share in the investigation, and would he remedy this defect before the Committee proceeded far with its work.

Mr. Attlee, in a written reply, stated that he had not heard of any dissatisfaction such as was suggested. The Committee was primarily concerned with technical matters and was in close touch with the industrial interests concerned. He was satisfied that its composition was suitable to the present inquiry.

Army Cadet Training

A NEW scheme of technical training has been introduced in the Army Cadet Force (open units) with the object of providing basic instruction for boys who wish to enter the Army technical services, or to follow technical trades in other branches of the service. At the same time it will make it easy for boys who have already entered industry to combine their pre-service Army training with uninterrupted attendance at civil continuation classes and evening studies arranged by local education authorities. Cadets who cannot attend such classes will find the new scheme a more practical alternative.

Some reliance is placed upon the new scheme's " interest value " to encourage less studious boys to take up one of the more advanced mechanical courses, since experience has shown that the less intelligent types are unwilling to do what they regard as school " overtime " in the evenings, whereas they often become quite keen on anything that enables them to use their hands and eyes.

At an explanatory meeting, Major-General Lord Bridgeman presiding, Brigadier F. T. Chapman (Deputy Director of Military Training (Technical), War Office) described how instruction in future will be in three categories. The first courses will qualify for the award of Certificate " T " (which is intended to have something like a negotiable value in respect of posting to chosen units); the syllabuses cover motor vehicle engines and electrical equipment, building, technical drawing and workshop practice, in addition to English, arithmetic, accounts, shorthand and typewriting. The second courses are of a more practical nature, which can be carried out in any workshop or other centre approved by the County Cadet Committee. The third courses are for cadets whose standard is not high enough to enable them to qualify for certificates. County Cadet Committees have been made responsible for organising the new scheme in co-operation with local education authorities.

Domestic Apparatus—V

The Trend of Design

MANY circumstances affect not only the probable popularity of the various alternative types of water-heating equipment—the ordinary immersion heater, the circulator, the self-contained thermal-storage unit and the geyser—but also their design. The hardness of the water in the districts to be served, the temperature of the water, the quantity and rate at which it is required, the presence or otherwise of alternative methods of heating, and the price at which the apparatus is to be sold, are only a few of the matters which the designer has to consider. Immediate post-war requirements are likely to be so diverse that all types will find a ready market, but there will probably be a tendency to install complete electric hot water services.

After dealing in our last article with cooker design, we complete our survey by considering improvements that might be made to other types of domestic appliances

Before the war there was a range of apparatus available to meet almost all requirements. There was a tendency to increase the loading of all types. Loadings have been kept low in the past by objections from electricity supply undertakings. There may be justification for this attitude in sparsely served areas, but in heavily loaded districts the diversity factor tends to even out surges and peaks. In any case it is hard to understand why undertakings should wink at the use of 2- or 3-kW radiators but object to water heaters loaded at more than about 1½ kW. Slightly higher loadings or larger capacity would overcome the principal criticism of electric water heaters, namely, their slow recovery time.

Lagging and Control

Apart perhaps from further devices for eliminating scaling, we perceive few immediate changes in the design of immersion and circulator types. Further attention must, however, be paid to the lagging of the water pipes and tanks.

Another not well enough known device for reducing consumption is the inclusion of a kink in the expansion pipe to seal the hot water. Three-heat switches on immersion heaters are now considered by many engineers quite unnecessary, but for installations in constant use thermostatic control is indispensable.

Many engineers and designers consider that the non-pressure type of thermal-storage unit is obsolete. A demand is expected for heaters to give a small quantity of hot water immediately with a larger quantity at short notice for washing, baths, etc., while, if the objections to their inevitable high loading are overcome, instantaneous geysers will probably be used extensively. The combination of water heaters with cookers may be another development. Whatever type of heater is employed, the user should be induced to install a unit sufficient fully to meet his requirements.

Attention should be paid to making self-contained thermal-storage heaters in more convenient shapes though mechanical soundness should not be sacrificed. A D-shaped design seems to have much to recommend it, since it has no protruding corners, fits close up to the wall, and is easy to fix. Methods of fixing might also be investigated, including the use of slotting and location of the brackets at the top and bottom instead of at the sides.

Electric Fires

The greatest immediate effect of the war will probably be a drastic reduction in the number of models of electric fires. While most of the people we have spoken to were satisfied with the designs produced just before the war, a minority has not a good word to say for them. These suggest that it would be worth while calling in the services of designers from outside the industry, perhaps architects.

Whether from choice or necessity brought about by the immense demand or shortage of materials, it is fairly certain that fire designs generally will tend to be simpler, for a time at any rate, which is all to the good. Simplicity need not, however, be an excuse for drabness or mediocrity. Many of the most attractive of the pre-war fires were simple to the point of severity. From the housewife's point of view designs which have no sharp corners and crevices will be welcomed.

The use of imitation coal and flicker devices will no doubt continue to be a selling point, though probably these will be superseded to a large extent by simple colour light effects. In either case there can be no question as to the value of some sort of lighting effect, not only on psychological grounds but also for the sake of economy. Once a room is warmed it is often quite enough to retain the impression of warmth without having the heating elements operating.

With the apparent tendency towards building apparatus into the structure of the house there is likely to be an increased demand for inset models. From many points

of view this is a development much to be desired. The necessity for flexible cables, the main source of breakdown and possible danger, is removed, while the manufacturer has a market for many more fires than if portable units were employed. The design of inset models does, however, demand rather more attention, particularly in the matter of ventilation.

Nevertheless there will be a great demand for portable fires. In the case of these, and inset types too, while the popularity of the parabolic reflector type has grown on account of the greater apparent heat, the flat fire-bar type will also continue to be required for use in situations where a focusing effect is a disadvantage. There are still some manufacturers and supply engineers who are convinced that the bowl fire will retain its popularity, because it is still the most efficient way of utilising 1 kW of heating, and is easier and cheaper to make in large quantities than other types. It has been suggested that a much larger reflector (17 in. diameter has been mentioned) might be used. It may be said that some bowl fires with diameters quite as great as 17 in. were on the market a quarter of a century or so ago. The heat is thus less concentrated and the fire can be placed close to furniture without risk of burning.

With regard to convectors, and tubular and panel heaters, these are ideal for many situations, but the public needs to be further informed of their advantages before they will be fully accepted. Though improved to a certain extent, fire element contacts in some cases still need attention.

Refrigerators

Despite the contention that our climate makes them unnecessary except on a very few days in the year, and that they are an unnecessary luxury for the artisan household, a promising future for domestic refrigerators seems assured. It has taken the war to make people appreciate fully their advantages, and mass production (and to a certain extent the elimination of expensive case-work on account of building in to kitchen schemes) should bring down the price very considerably. Cost is not, however, the only consideration. As has been evidenced by the motor-car and the radio-gramophone, expense is not necessarily the deciding factor in purchase, if the demand is created.

In the past few years the compressor type of apparatus has practically ousted the absorption type. To-day there seems to be a possibility that the latter may have a new lease of life, principally, we imagine, on the score of simplicity of construction and quietness of operation. Its disadvantage of having a consumption of perhaps three times that of the compressor type unit is not considered important as the loading is low. One manufacturer, at any rate, plans to produce an absorption type unit in large quantities.

Some of the refrigerators planned, especially those intended for building in to comprehensive kitchen units, are apparently to have a capacity of 1½ cu. ft. which is surely too small. Many people put the minimum desirable size as high as 6 cu. ft. Although it may be thought that any refrigerator, no matter how small, is better than no refrigerator at all, the introduction of inadequate units may do more harm than good; for comparatively little extra expense it should be possible to produce apparatus of a really practical size. It is most desirable, in order that the available capacity could be utilised to its full extent, that the apparatus should be supplied complete with dishes, etc., specially designed to fit into the interior.

Robust construction is essential, and any model designed to minimise maintenance will score heavily. Service considerations have greatly restricted developments in some areas. There is much virtue in making the compressor a separate, easily replaceable unit, which, incidentally, would fit more conveniently into schemes of kitchen planning.

Laundry Equipment

If the washing machine and wash boiler are to continue to be portable appliances (that is, not built into comprehensive kitchen units) there is a need for lighter construction. Most of them are far too cumbersome to be moved about conveniently. To this the lighter alloys and plastics could make a valuable contribution. The use of a plastic material unaffected by the action of soap is also suggested for the washing machine agitator.

The need for concentrating on smooth exteriors with no sharp corners scarcely needs mentioning, and the tendency towards square designs will be a further development of planned kitchens, which will also necessitate a slight increase in the height of most apparatus.

It would appear logical for washing machines to have incorporated heating elements, especially if they are intended to supersede wash boilers, but some engineers consider this unnecessary, declaring that boiling is only required to produce motion in the water, which in the case of the washing machine is provided by the agitator.

Lids and methods of fixing them, whether they should be hinged or removable, provide the main topic of discussion with regard to wash boilers. As it is difficult to employ immersion type elements, a safety device is more or less essential, and many engineers also consider a switch on the boiler very desirable. It would be thought that the need for having the drain at the bottom was obvious, but too often the boiler has to be

tilted to run all the water out. Some of the draw-off cocks now in use also prove unsatisfactory in hard water districts.

So long as the difference of price is considerable there will be a market for both ordinary and thermostatically controlled irons. Thermostatic control is very desirable as it facilitates the work and prevents overheating and damage. Some manufacturers have decided that a removable connector is superfluous, but still more investigation is necessary into the method of fixing the flexible and also into the rubbing qualities of the flexibles themselves. The production of unbreakable handles and back-rests would remove one very serious cause of trouble.

Vacuum cleaners as at present constructed are restricted in efficiency by weight and size limits. Often the motor used is too small and the vacuum obtained is not sufficient. The use of lighter materials will help to overcome this difficulty. The demand for both cylindrical and outside bag types will probably continue and there is a trend to do away with accessories on the latter in favour of a special small hand cleaner for purposes other than floors. Provision should also be made for floor polishing, though some manufacturers do not consider it very satisfactory to combine a vacuum cleaner and polisher in the same machine.

Built-in vacuum cleaning systems have advantages; they permit the use of more powerful motors, save carrying cleaners from room to room, and may be more hygienic. But there are drawbacks, too. It is necessary to manipulate flexible tubing, at least 2 in. in diameter, and probably 16 ft. long. Unless a most efficient automatic connector is used there is a considerable loss of suction and inevitably the outlets are inadvertently left open. The cost is greater than for a portable machine. There is also the question of where the plant should be installed, and its possessor is unable to take it with him if he moves.

Provincial Supply Association

Chairman's Review of Recent Activities

THE twenty-third annual general meeting of the Provincial Electric Supply Association was held at the Savoy Hotel, London, on March 3rd. Mr. Selwyn S. Grant, O.B.E., presided and 125 companies were represented, while the guests included Lord Brabazon of Tara, president of E.D.A.

After referring with regret to the death of Col. Walter Bridges, who had been a valued member of the Executive Committee, the chairman briefly reviewed the activities of the Association. He said that the committee representative of all electricity supply associations which had been formed to consider bulk trading conditions had met on a number of occasions and had consulted with the Electricity Commissioners, but so far not much progress had been made. Also, despite repeated requests to the Treasury for expedition, the draft Bill with regard to war damage to public utility undertakings had not yet been issued. Negotiations were continuing in the matter of the Town and Country (Interim Development) Bill which, in the Association's opinion, prejudiced their statutory rights and might cause development to be obstructed.

The association had agreed to a proposal by the Board of Inland Revenue that the wear and tear allowance on generating plant should continue at the rate of 8 per cent. for the next two years, thereafter to be reviewed annually. With regard to meters it had agreed that the rate of 7½ per cent. per annum on the written down value should continue indefinitely.

Due to the withdrawal of the Power Companies' Association, the Joint Committee of Electricity Supply Associations had been provisionally re-named the Joint Committee of Electricity Supply Organisations, but some eleven of the power companies had since rejoined the Committee as a Power Company Group. Mr. Grant considered that the Committee served a useful and helpful purpose.

The chairman said that so far the industry had been spared the worries of fuel rationing but voiced a warning that unless the utmost economy was practised restriction might yet become necessary. With regard to wages, the N.J.I.C. had awarded a further 1d. per hour to war bonus, making it 5d., and there were indications that another increase was imminent. He thanked Mr. Parkinson for his work on the Association's behalf in this matter.

Dealing with the subject of post-war reconstruction, the chairman recounted the events leading up to the publication of the joint memorandum with the I.M.E.A. and spoke appreciatively of the understanding attitude adopted by the I.M.E.A., through its president. Mr. F. Newey, who took a leading part in the co-ordinating committee. On the question of the ownership of distribution undertakings he considered that the time had come for plain speaking. All things being equal, company-owned undertakings could compare favourably with any other class of ownership in the rates charged, but it was seldom remembered that companies operated to a large extent in rural areas, in the development of which they had been pioneers.

In conclusion, the chairman acknowledged the Association's debt to Mr. A. J. Fippard for the great amount of work he had carried out, notably in regard to the memorandum on post-war reconstruction. He also expressed thanks to Sir John Dalton, Mr. E. G. Baker (assistant secretary) and Mr. I. R. G. Jones.

The balance sheet and accounts were then presented and approved and the Executive Committee was re-elected *en bloc*. With regard to subscriptions it was resolved that the Committee should be authorised to increase them if necessary by not more than 50 per cent. The business closed with a vote of thanks to the chairman proposed by Capt. J. M. Donaldson, M.C., to which Mr. Grant briefly responded.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

The British Power & Light Corporation, Ltd.—Mr. Robert Nelson, acting chairman, presiding at the annual meeting on March 16th, referred with regret to the death of Sir Robert Hilton and said that Group-Capt. Benson had resumed the chairmanship and it was hoped that the time was not far distant when he would again be able to preside. After reviewing the accounts, Mr. Nelson said that no conclusion had been reached by the Government Department concerned in the matter of the treatment of war damage in the case of a public utility undertaking, but account had been taken by the directors of the possible charges.

They had appointed two engineers to investigate the water power resources in their area. The prospects, so far as it had been possible to gauge them, were encouraging. Further water power was available, but it was as yet too early to say whether its economical development was practicable. In a reference to the proposals for the reorganisation of the electricity supply industry he said that he hoped it would not be overlooked that without private enterprise there would have been little or no rural development. If the power companies and their associated distribution companies were left to continue as they might reasonably hope to be, there were important extensions still to be undertaken which they were in the best position to carry through.

Midland Counties Electric Supply Co., Ltd.—Speaking at the annual meeting on March 16th Mr. W. Shearer (chairman) said that the absence of statistics during the war, which would show the industry's immense contribution, had somewhat assisted exponents of state or regional control in their endeavours to abolish private enterprise. Some of the advocacy of partial nationalisation of one form or another had come from quite unexpected quarters. The industry had been attacked as having a free field, no competition and statutory rights to charge for its commodity, but there were several competitors in the field for heating, cooking, power; prices and dividends were already limited. If, however, existing safeguards were considered inadequate they could be altered or extended by simple means. There was not a shred of evidence that private enterprise (more fittingly described as "business management") as applied to the electricity supply industry had failed, nor had any information been given as to how the proposed changes would benefit the public. The country would be much better served if Government and quasi-Government organisations avoided further experiments in the trading sphere.

Referring to proposals to hand over the business of power companies he said it would be a retrograde step to allow the disruption of these successful units to materialise. He considered that a greater uniformity of tariffs and some standardisation of systems and voltages could be achieved without recourse to anything akin to nationalisation. So far as their own company was concerned, a modified scale of charges, applicable to all directly supplied consumers throughout the whole of their area of some 2,400 sq. miles, was instituted in July last. The new scale compared favourably with the existing tariffs of other undertakings and represented a saving of £133,500 to consumers.

Mr. Shearer claimed that more than 92 per cent. of the company's area had electricity available. The remainder comprised very sparsely populated districts. After references to the Government's reconstruction plans, Mr. Shearer said that the report of the McGowan Committee provided Lord Woolton with most important material. The Committee's recommendations had been generally accepted by authoritative opinion in the country as affording the basis of a most satisfactory development of electricity distribution. The report recently made by the Incorporated Association of Electric Power Companies generally followed the lines of the McGowan Report with certain amendments and modifications. Referring to the proposals of the I.M.E.A., he said that it was inconceivable that the large municipalities would favour the transfer of their generating stations to the Central Board.

The Lancashire Electric Light & Power Co., Ltd., in its report for 1943 mentions a revision in the form of accounts, mainly affecting the treatment of taxation. The profit balance for the year is shown at £370,466. To this is added £15,415 brought forward and, after providing for debenture stock redemption, income tax, the fixed dividends on the 6 per cent. preference and 7 per cent. participating preference shares and the interim ordinary dividend (2¼ per cent.), there is an available balance of £89,878 (against £90,415). An additional ¼ per cent. on the participating preference and a final ordinary dividend of 5 per cent. (again making 7½ per cent.) are recommended, leaving £14,878 to be carried forward. The report says that the operations of the subsidiary companies have continued satisfactorily and the properties have been efficiently maintained out of current revenue.

The British Thomson-Houston Co., Ltd., held its meeting on Monday. Mr. H. N. Sporborg presided and referred with great regret to the deaths of Mr. J. L. Wilson and of Mr. W. C. Lusk who he has succeeded as chairman. Proceeding, Mr. Sporborg said that the manufacturing plants had been maintained in as high a state of efficiency as possible in the prevailing circumstances and ample provision had again been made for depreciation. The company had maintained to the utmost its activities in the education and training of young engineers and of operators who were newcomers to the industry. Their research staff and laboratories had been augmented. He need not stress the vital importance of research to the company, the industry and the nation.

After a reference to the company's contribution to the development of the jet engine, Mr. Sporborg said that the board was fully alive to

the many urgent problems which would need to be dealt with as soon as a change in the war situation permitted.

The Enfield Cable Works, Ltd., from a profit of £117,206 (against £166,623) is paying a final dividend of 6¼ per cent., again making 12½ per cent. for the year.

India Rubber, Gutta Percha & Telegraph Works Co., Ltd.—The trading profit for the past year rose from £144,253 to £169,333. As already reported, the dividends on the preferred ordinary shares are maintained at 8 and 9 per cent. respectively.

The Bournemouth & Poole Electricity Supply Co., Ltd., is holding a meeting on March 28th for the purpose of considering a resolution altering the articles of association to permit the company to appoint as a director a person who may be a paid official of the company. At present the only paid office which a director can hold is that of managing director.

The Singapore Traction Co., Ltd., states that its debit increased from £102,895 to £118,234. Against this is placed recovered E.P.T. and income tax amounting to £47,000, and the reserve for income tax no longer required, making a total of £122,783 which leaves a provisional credit of £4,549 to be carried forward.

Taylor Tunnicliff (Electrical Industries), Ltd., report a trading profit and sundry income totalling £83,297 for 1943 (against £99,113). The net profit, after meeting expenses, depreciation and taxation, was £27,244, as compared with £40,472. The dividends paid to the company amounted to £20,616 (against £28,094). The final ordinary dividend is 7½ per cent. (against 12½ per cent.), reducing the year's distribution from 15 to 10 per cent.

British Insulated Cables, Ltd.—The accounts, prepared in a new form, show a profit for the past year of £1,130,253 (against £1,149,031). After providing for depreciation, income tax and war contingencies reserve account, £100,000 (same), it is proposed to pay a final dividend of 10 per cent. on the ordinary stock with a cash bonus of 5 per cent., again making 20 per cent. for the year. The balance carried forward is reduced from £428,227 to £390,484.

The Automatic Telephone & Electric Co., Ltd., reports a profit of £280,952 for the past year, as compared with £261,888 for 1942. It is proposed to transfer £20,000 to war contingencies reserve (against nil). The final ordinary dividend is 7 per cent., with a bonus of 2½ per cent., again making 12½ per cent. for the year The dividend and bonus on the deferred stock are also maintained at 12½ per cent.

Ericsson Telephones, Ltd.—After providing for depreciation, obsolescence, taxation, etc., the net profit for the past year is £112,837, as compared with £110,960. As already reported, the year's distribution is maintained at 20 per cent. free of tax by a final ordinary dividend of 12 per cent. plus a bonus of 3 per cent. General reserve receives £20,000 (same).

The National Gas & Oil Engine Co., Ltd., states that its profit for 1943, after providing for depreciation, taxation, etc., and including £1,652 income from investments and £20,000 transferred from contingencies reserve, amounted to £67,263, against £59,103. The ordinary dividend is again 5 per cent. and £30,000 is transferred to general reserve.

Lancashire Dynamo & Crypto, Ltd., is again paying a final dividend of 10 per cent. and a bonus of 7½ per cent. on its ordinary shares, making 22½ per cent. for the past year (same). The net profit rose from £122,020 to £127,000.

E. K. Cole, Ltd., have extended the period of their offer to purchase the ordinary shares of Ensign Lamps, Ltd., to May 1st. It is stated that up to March 17th holders of 66 per cent. of the outside shares had accepted the offer.

Tecalemit, Ltd., is offering to shareholders 342,750 5s. shares at 15s. a share in the proportion of one to each four shares at present held. The market price of the company's shares stands at about 18s.

Hoover, Ltd.—The net profit for 1943 rose from £328,850 to £452,659. The final ordinary dividend of 11½ per cent. maintains the year's dividend at 15 per cent. In addition a cash bonus of 5 per cent. is to be paid.

The Globe Telegraph & Trust Co., Ltd., announces the payment of a quarterly dividend of 1 per cent., free of tax.

Pye (Ireland), Ltd., is again paying an ordinary dividend of 7½ per cent. The trading profit for 1943 was £7,467, against £7,968.

Waste Heat & Gas Generating Stations, Ltd., is again paying a final dividend of 5½ per cent., making 8 per cent. for the past year. Gross dividends and interest for the year to January 31st last amounted to £18,803 against £18,420.

G. D. Peters & Co., Ltd.—From a net profit of £63,575 (against £54,832) it is proposed to pay a final dividend of 7½ per cent., again making 15 per cent., plus a special cash bonus of 2½ per cent.

The Anglo-American Telegraph Co., Ltd., has declared a dividend of ¾ per cent. on the ordinary and 1½ per cent. on the preferred ordinary stock for the quarter ending March 31st.

Brown Bros., Ltd.—From a net profit of £102,763 (against £95,593) it is proposed to pay a final ordinary dividend of 10 per cent. maintaining the distribution at 12½ per cent.

The Watford Electric & Manufacturing Co., Ltd., has again declared a final dividend of 10 per cent., making 15 per cent. for the year.

Broom & Wade, Ltd., report a rise in net profit for 1943 from £28,510 to £55,455. The ordinary dividend for the year again totals 22½ per cent.

The Woking Electric Supply Co., Ltd., has declared a final dividend of 4½ per cent., free of tax, maintaining the year's distribution at 7½ per cent., tax free.

London Associated Electricity Undertakings, Ltd., is increasing its dividend for the past year from 3 to 4 per cent.

The Scottish Power Co. is maintaining the past year's distribution at 8 per cent. by a final payment of 5 per cent.

The North Somerset Electric Supply Co., Ltd., is again paying a dividend of 7 per cent.

The West Gloucestershire Power Co., is to pay a dividend of 3½ per cent. for 1943 (same).

Worthington-Simpson, Ltd., are repeating their dividend of 7 per cent. in respect of the past year.

New Companies

William Kent (Porcelains), Ltd.—Private company. Registered March 11th. Capital, £30,000. Objects: To carry on the business of electrical, motor and wireless engineers, manufacturers of, and dealers in, porcelain and other insulating materials and electrical goods, etc. Directors: E. J. Kent, Thelma, Park Lane, Congleton, and S. N. Kent, Stratheden, Sutherland Drive, Westlands, Newcastle, Staffs. Secretary, E. Watkin. Registered office: Novelty Works, Wellington Street, Burslem, Stoke-on-Trent.

Lanking Engineering Co., Ltd.—Private company. Registered March 6th. Capital, £500. Objects: To carry on the business of manufacturers and repairers of, and dealers in, dynamos, motors, insulating materials, stoves, cookers and general electrical plant and supplies, mechanical engineers, etc. Subscribers: F. T. Smith and A. Vandyk, Donington House, Norfolk Street, W.C.2. Solicitors: Herbert Oppenheimer & Co., W.C.2.

Ryder Installations, Ltd.—Private company. Registered March 9th. Capital, £1,000. Objects: To carry on the business of manufacturers of, and dealers in, electric lamps, signs, switches, shades, holders, plant, accessories and equipment, radio and electrical engineers, etc. Directors: C. C. Palmer, 32, Beverley Way, West Wimbledon, and H. F. Minter, 44, Pangbourne Drive, Stanmore, Middx. Registered office: 247, High Street, Hounslow, Middx.

Fleming Radio (Developments), Ltd.—Private company. Registered March 3rd. Capital, £100. Objects: To carry on the business of radio, television and electrical engineers, etc. Subscribers: A. H. D. Fairbairns and Eleanor M. Cattell, both of 11, Sheffield Street, W.C.2. Solicitor: E. W. M. Baldwin, 5, Southampton Place, Bloomsbury, W.C.

Companies' Returns

Statements of Capital

Perak River Hydro-Electric Power Co., Ltd.—Capital, £3,500,000 in 1,250,000 5 per cent. cumulative preference, 1,750,000 ordinary and 500,000 "A" shares of £1 each. Return dated December 14th. All preference and ordinary shares taken up. £808,041 paid on 400,000 preference and 408,041 ordinary shares. £2,191,959 considered as paid on 850,000 preference and 1,341,959 ordinary shares. Mortgages and charges: £630,200.

London Electrical Manufacturing Co., Ltd.—Capital, £600 in £1 shares. Return dated December 20th. 552 shares taken up. £552 paid. Mortgages and charges: Nil.

Dunmow Light & Heat Co., Ltd.—Capital, £10,000 in £1 shares. Return dated November 19th (filed December 21st). 8,500 shares taken up. £8,500 paid. Mortgages and charges: £1,500.

Electro Metals, Ltd.—Capital, £30,000 in 4,000 preference shares of £5 and 10,000 ordinary shares of £1. Return dated December 31st, 1943 (filed February 5th, 1944). 102 preference and 10,000 ordinary shares taken up. £510 paid on the preference shares. £10,000 considered as paid on the ordinary shares. Mortgages and charges: Nil.

Patterson Lamps, Ltd.—Capital, £15,000 in £1 shares. Return dated November 30th. 14,500 shares taken up. £6,330 paid. £8,170 considered as paid. Mortgages and charges: Nil.

J. Poore & Sons, Ltd.—Capital, £1,000 in £1 shares. Return dated December 31st (filed February 23rd). All shares taken up. £1,000 considered as paid. Mortgages and charges: £156.

Holderness Trust, Ltd.—Capital, £5,000 in £1 shares. Return dated December 20th. 3,000 shares taken up. £900 paid (6s. per share). Mortgages and charges: Nil.

Simplex Electric Co., Ltd.—Capital, £500 in £1 shares. Return dated December 9th. All shares taken up. £500 paid. Mortgages and charges: Nil.

Implitico, Ltd.—Capital, £3,000 in £1 shares. Return dated December 9th. All shares taken up. £3,000 paid. Mortgages and charges: Nil.

Wilkinson, Bentley & Co., Ltd.—Capital, £3,000 in £1 shares. Return dated December 13th. 1,850 shares taken up. £1,850 paid. Mortgages and charges: Nil.

Intensalite Sign & Fixtures Co., Ltd.—Capital, £1,000 in £1 shares. Return dated December 31st. All shares taken up. £1,000 paid. Mortgages and charges: Nil.

Increase of Capital

Radio Rentals, Ltd.—The nominal capital has been increased by the addition of £100,000 beyond the registered capital of £250,000. The additional capital is divided into 400,000 ordinary shares of 5s. each.

Mortgages and Charges

Tom Jones (Electrical Engineers), Ltd.—Mortgage on 19, Church Road, Liverpool, 15, dated March 6th, 1944, to secure all moneys due or to become due from the company to Martins Bank, Ltd.

Rainbow Radio Manufacturing Co., Ltd.—Assignment of proceeds of contract, dated February 23rd, 1944, to secure all moneys due or to become due from the company to District Bank, Ltd.

E. Dyne & Co., Ltd.—Mortgage on proceeds of contract, dated March 2nd to secure all moneys due or to become due from the company to Midland Bank, Ltd.

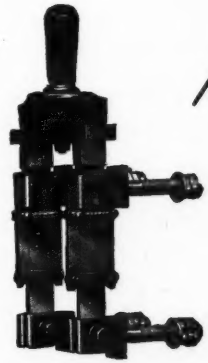
Liquidations

Birkdale District Electric Supply Co., Ltd.—Meeting on April 19th at 88, Kingsway, London, W.C.2, pursuant to Section 236 of the Companies Act, 1929, to receive an account of the winding-up. Liquidators: Messrs. F. J. Cursons and G. H. Humphries.

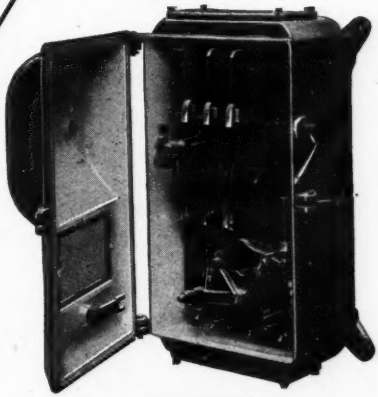
The Ogmore Valley Electric Light & Power Supply Co., Ltd.—Meeting on April 21st, at the Ogmore Valley Hotel, Ogmore Vale, Glam., to receive an account of the winding-up by the liquidator, Mr. A. P. Adams.

THE VERITY RANGE

MOTORS



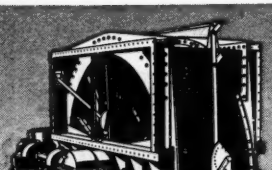
SWITCHGEAR



STARTERS

VERITYS LTD. ASTON, BIRMINGHAM 6

Sales Headquarters : BRETTENHAM HOUSE, LANCASTER PLACE, W.C.2



HEAVY DUTY FANS.

MECHANICAL DRAUGHT FANS.

SINTERING FANS.

HOWDEN-LJUNGSTROM AIR PREHEATERS.

HOWDEN TURBULENT FLOW AIR PREHEATERS.

HOWDEN I.C.I. GAS WASHERS.

HOWDEN VORTEX DUST COLLECTORS.

Howden auxiliaries for all types of boilers, from the largest power station plant to the smallest industrial installation.

HOWDEN

James Howden & Company (Land) Ltd.
195, Scotland Street, Glasgow, C.5, and
101-103, Baker Street, London, W.1.

STOCKS AND SHARES

TUESDAY EVENING.

STOCK EXCHANGE prices hold their ground with noteworthy firmness and business is quiet in most of the markets. The Budget begins to take vague shape as likely to prove temporarily a possible deterrent to financial enterprise. But money is going into stocks and shares, as is evidenced by the rises in values. Callender's Cable, Westinghouse Brake, Metal Industries, India Rubber preference and Siemens are all better. Speculative investment in the radio group has lifted E.M.I. and Cossor shares.

Transport "C"

One of the week's minor features has been a rise of 4 points to 70 in London Passenger Transport "C" stock. This is the highest price touched during the present year. In 1943, Transport "C" rose to 72. In 1937, the price touched three figures; at the other end of the recent scale, 24 was the lowest, reached in 1940. In spite of the fact that the net revenue of the Board last year showed a small decrease as compared with 1942, the "C" dividend was raised by 5s. per cent. to 3¼ per cent., and this seems to have inflamed expectation to the point at which a further advance is looked for in respect of the current year. By comparison with other junior stocks in the Home Railway market, Transport "C", as already mentioned here on more than one occasion, looks expensive.

Home Electricity Supply

Home electricity supply shares maintain a firm front in the face of the air raids. So far from these having the effect of frightening shareholders out of their interest, it would appear as though the opposite were the case, because inquiry has been searching the lists for shares that may be offered at lowered prices. Scattered selling occurred once or twice, but the shares were taken; on balance, this week's price movements are negligible. The argument runs that if a supply company should be unfortunate enough to suffer from enemy action, it will probably be found that the company has reserves large enough to meet any ordinary contingency and that, though its business might be disturbed for a time, the effect upon post-war operations would be of no account.

City Lights have rallied to 27s. 6d.; South Londons at 28s. are 1s. up. British Power advanced to 33s. on the increase in the dividend. Provincial shares are a trifle easier in places. In the Overseas group, no material changes have occurred.

Dividends and Reports

Lancashire Dynamo shares have changed hands up to 95s. upon repetition of the dividend and bonus, making altogether 22½ per cent., less tax, for the year, following a similar distribution in 1942. Generally speaking, the dividends and reports now being issued are satisfactory. Some nine out of ten show either improvement in profits or substantially increased allocations to reserves. Taxation pares profits and prevents any great addition to the number of companies that raise their dividends. The accounts are good in most cases and this serves, of course, to keep prices steady. British Insulated is paying 20 per cent. for the ninth consecutive year. The British Aluminium Company's profit of £1,068,937 is £17,000 up, and the dividend is carried on at 10 per cent. for the year. An increase of 1 per cent. in the dividend is announced by London Associated Electricity, making 4 per cent. against 3 per cent. for 1942. The present 4 per cent. reinstates the rate paid in 1941. The price of the shares remains at 23s. the effect of the better dividend having been discounted.

Ericsson Telephones

The payment by Ericsson Telephones, Ltd., of a final dividend of 12 per cent. with a bonus of 3 per cent., both tax free, making 20 per cent. for 1943, is at the same rate as were the dividends for 1941 and 1942. From 1936 to 1939, the annual dividend and bonus were 25 per cent. tax free. For 1940, the company paid 22 per cent. tax free. At the present price of the shares the yield is a little under 2 per cent. net. The modesty of the return indicates the hope that the company will be able to resume, in the near future, at all events 22 per cent., if not 25 per cent., tax free. Of the issued capital, there is £375,000 in ordinary shares of 5s. each. The price went down to 22s. 6d. in the black year of 1940; the present 52s. 9d. is the highest since 1937, when 58s. 9d. was touched. The company goes back to 1903; the name was changed to its present one in 1926. Profits have consistently expanded every year from 1937 onwards.

Globes and Cable Preference

Investment will find interest in comparing the prices of Cable & Wireless 5½ per cent. preference stock and Globe Telegraph & Trust ordinary shares. Reference to our yield table shows that Cable preference at to-day's price gives a return of £4 14s. 10d. and that Globes pay £2 13s. 4d. The latter, being free of tax, is equivalent to £5 6s. 8d. per cent. taking tax at 10s. in the £. The Globe Company holds over £3,000,000 Cable preference stock and a little over £1,000,000 ordinary stock, the book value of the two being £2,124,486. The present market value of these stocks is approximately £4,400,000, which gives a hidden reserve

(*Continued on page* 429)

ELECTRICAL INVESTMENTS

Prices, Dividends and Yields

Company	Dividend Previous	Dividend Last	Middle Price Mar. 21	Rise or Fall	Yield p.c. £ s. d.
Home Electricity Companies					
Bournemouth and Poole	12½	12½	62/–xd	..	4 0 8
British Power and Light	6	7	33/–	+6d.	4 4 10
City of London	7	5½	27/6	+6d.	4 0 0
Clyde Valley	8	8	41/6xd	..	3 17 0
County of London	8	8	40/–	..	4 0 0
Edmundsons:					
7% Pref.	7	7	34/6	..	4 1 4
Ord.	6	6	29/–	..	4 2 9
Elec.Dis.Yorkshire	9	9	44/6	−6d.	4 1 0
Elec. Fin. and Securities	12½	12½	55/–	..	4 11 0
Elec. Supply Corporation	10	10	47/–	..	4 5 0
Isle of Thanet	Nil	Nil	18/–	..	—
Lancs. Light and Power	7½	7½	36/–	−1/–	4 3 4
Llanelly Elec.	6	6	25/–	..	4 16 0
Lond.Assoc.Electric	3	4	23/–	..	3 9 7
London Electric	6	6	28/–	..	4 5 9
LondonPowerRed. Deb.	5	5	103½	..	4 14 7
Metropolitan E.S.	8	8	40/6	+6d.	3 19 0
Midland Counties	8	8	40/6	..	3 19 0
Mid. Elec. Power	9	9	45/–	..	4 0 0
Newcastle Elec.	7	7	30/6xd	..	4 12 0
North Eastern Elec.:					
Ordinary	7	7	33/6xd	..	4 3 7
7% Pref.	7	7	35/–xd	+⅛	4 0 0
Northampton	10	10	48/–	..	4 3 4
Notting Hill 6% Pref. (£10)	6	Nil	11	..	—
Northmet Power:					
Ordinary	7	7	38/–	..	3 13 9
6% Pref.	6	6	30/6	..	3 18 8
Richmond Elec.	6	6	25/6xd	..	4 14 1
Scottish Power	8	8	40/6	..	3 19 0
Southern Areas	5	5	23/–	..	4 7 0
South London	7	7	28/–	+1/–	5 0 0
West Devon	5	5	23/6	..	4 5 0
West Glos.	4½	3½	23/5	−6d.	2 19 7
Yorkshire Elec.	8	8	43/–	..	3 14 5
Overseas Electricity Companies					
Atlas Elec.	Nil	Nil	6/3	..	—
Calcutta Elec.	7*	6*	36/6	+6d.	3 5 8
Cawnpore Elec...	10	10	35/–	..	5 14 3
East African Power	7	7	33/–	..	4 4 10
Jerusalem Elec...	7	5	28/6	..	3 10 2
Kalgoorlie (10/–)	5	5	10/–	..	5 0 0
Madras Elec.	4*	Nil	23/–	−6d.	—
Montreal Power.	1½	1½	23½	..	6 7 8
Palestine Elec."A"	4*	5*	40/–	..	2 10 0
Perak Hydro-elec.	6	7	10/–	..	—
Shawinigan Power	83cts.	90cts.	17	..	—
Tokyo Elec. 6%	6	6	18	..	—
VictoriaFallsPower	15	15	4⅛	..	3 9 7
Whitehall Inv.Pref.	—	6	23/6	−6d.	5 2 2

Company	Dividend Previous	Dividend Last	Middle Price Mar. 21	Rise or Fall	Yield p.c. £ s. d.
Public Boards					
Central Electricity:					
1955–60 (Civil Defence)	—	2	100	..	3 6 0
1955–75	5	5	114	..	4 7 9
1951–73	4½	4½	107	..	4 4 1
1963–93	3½	3½	104	..	3 7 4
1974–94	3½	3½	101	..	3 4 6
London Elec. Trans. Ltd.	2½	2½	97	..	2 11 3
London & Home Counties1955–75	4½	4½	112	..	4 0 4
Lond.Pass.Trans.:					
A	4½	4½	123½	..	3 13 0
B	5	5	121½	..	4 2 4
C	3	3½	70	+4	4 12 10
WestMidlandsJ.E.A. 1948–68	5	5	108½	..	4 12 4
Telegraph and Telephone					
Anglo-Am. Tel.:					
Pref.	6	6	118	..	5 1 8
Def.	1½	1½	29	..	5 3 5
Anglo-Portuguese	8	8	24/–	..	6 13 4
Cable & Wireless:					
5½ Pref.	5½	5½	116	+1	4 14 10
Ord.	4	4	81½	+½	4 18 2
CanadianMarconi$1	Nil	4cts.	9/9	..	—
Globe Tel. & Tel.:					
Ord.	8½*	5*	37/6	..	2 13 4
Pref.	6	6	30/–	..	4 0 0
Great Northern Tel. (£10)	Nil	Nil	19½	−1	—
Inter. Tel. & Tel.	Nil	Nil	16½	+1	—
Marconi-Marine.	7½	7½	33/–	..	4 11 0
Oriental Tel. Ord.	16	10	44/–	..	—
Telephone Props.	6	Nil	16/–	..	—
Tele.Rentals(5/–)	10	10	11/6	..	4 7 0
Traction and Transport					
Anglo-Arg.Trans.:					
First Pref. (£5)	Nil	Nil	2/6	..	—
4% Inc.	Nil	Nil	7	..	—
Brit.Elec.Traction:					
Def. Ord.	45	45	1115	..	4 0 7
Pref. Ord.	8	8	175	..	4 11 5
Bristol Trams	10	10	54/6	+6d.	3 13 5
Brazil Traction	$1	$1⅛	26⅛	..	6 17 6
Calcutta Trams	5½	6½	39/–	..	3 6 8
Cape Elec. Trams	5	6	26/–	..	4 12 4
Lancs. Transport	10	10	45/6xd	+⅛	4 8 0
Mexican Light:					
1st Bonds	5	5	101½	..	4 18 7
Rio 5% Bonds	5	5	106½	..	4 13 9
Southern Rly.:					
5% Prefd.	5	5	76½	−½	6 10 9
5% Pref.	5	5	116½	−½	4 5 10
T. Tilling	10	10	58/–	..	3 9 0
West Riding	10	10	45/–	..	4 9 0

(*Continued on next page*)

* Dividends are paid free of Income Tax.

Company	Dividend: Previous	Dividend: Last	Middle Price Mar. 21	Rise or Fall	Yield p.c.
Equipment and Manufacturing					£ s. d.
Aron.Elec.Ord. ..	10	15	55/-	..	5 9 1
Assoc. Elec. :					
Ord.	10	10	52/6	..	3 16 0
Pref.	8	8	39/6	..	4 1 0
AutomaticTel.&Tel.	12½	12½	61/-	..	4 0 8
Babcock & Wilcox	11	11	50/-	..	4 8 0
British Aluminium	10	10	48/-	..	4 3 4
British Insul. Ord.	20	20	5 5/8	..	3 15 4
British Thermostat (5/-)	18½	18½	19/-	..	4 17 4
British Vac. Cleaner (5/-)	15	30	27/-	..	5 11 1
Brush Ord. (5/-)	6	8	9/-	..	4 9 0
Burco (5/-) ..	15	17½	15/6	..	5 13 0
Callender's ..	15	20	103/-	+1/-	3 17 8
ChlorideElec.Storage	15	15	80/-	..	3 15 0
Cole, E. K. (5/-)	10	15	26/3	+3d.	2 17 2
Consolidated Signal	24	27½	6	..	4 11 6
Cossor, A. C. (5/-)	7½*	10*	24/6	+1/6	2 0 10
Crabtree (10/-) ..	17½	17½	38/3xd	..	4 11 5
Crompton Parkinson Ord. (5/-) ..	20	22½	29/-	..	3 17 7
E.M.I. (10/-) ..	6	8	29/-	+1/-	2 15 2
Elec.Construction	10	12½	50/-	..	5 0 0
Enfield Cable Ord.	12½	12½	59/-	..	4 0 4
English Electric .	10	10	50/-	−6d.	4 0 0
EnsignLamps(5/-)	25	15	22/6	..	3 6 8
Ericsson Tel. (5/-)	22*	20*	52/9	..	1 18 0
Ever Ready (5/-)	40	40	39/-	..	5 2 7
Falk Stadelmann	7½	7½	33/6	..	4 9 7
Ferranti Pref. ..	7	7	30/-	..	4 13 4
G.E.C. :					
Pref.	6½	6½	34/-	..	3 16 6
Ord.	17½	17½	92/-	−6d.	3 16 1
General Cable (5/-)	15	15	15/-	..	5 0 0
Greenwood & Batley	15	15	41/3	..	7 5 9
HallTelephone(10/-)	12½	12½	26/3	..	4 15 1
Henley's (5/-) ..	20	20	26/3	..	3 16 2
4½% Pref. ..	4½	4½	24/-	..	3 15 0
Hopkinsons ..	15	17½	62/6	..	5 12 0
India Rubber Pref.	5½	5½	22/-xd	+9d.	5 0 0
Intl. Combustion	30	30	6 1/2xd	+½	4 18 0
Johnson & Phillips	15	15	72/-	..	4 3 4
LancashireDynamo	22½	22½	93/6	..	4 16 2
Laurence,Scott(5/-)	12½	12½	13/-	..	4 16 2
London Elec. Wire	7½	7½	34/6	..	4 7 0
Mather & Platt .	10	10	54/6	+9d.	3 14 5
Metal Industries (B)	5	8	46/-	+1/-	3 9 7
Met.Elec.CablePref.	5½	5½	21/3	..	5 3 6
Murex	20	20	102/6	..	3 18 2
Pye Deferred (5/-)	25	25	26/3	..	4 15 3
Revo (10/-) ..	17½	17½	38/6	..	4 11 0
Reyrolle ..	12½	12½	68/9	..	3 12 8
Siemens Ord. ..	7½	7½	33/6	+6d.	4 9 7
Strand Elec. (5/-)	7½	10	7/9	..	6 9 0
Switchgear & Cowans (5/-) ..	10	20	18/-	..	5 11 1
T.C.C. (10/-) ..	5	5	18/9	..	2 13 4
T.C. & M. ..	10	10	52/-	..	3 17 0
Telephone Mfg. (5/-)	9	9	11/-	..	4 1 10
Thorn Elec. (5/-)	20	20	22/6	..	4 9 0
Tube Investments	20	20	96/6	..	4 3 0
Vactric (5/-) ..	Nil	Nil	15/-	+6d.	—
Veritys (5/-) ..	7½	7½	7/6	..	5 0 0
WalsallConduits(4/-)	55	55	46/6	..	4 14 7
Ward & Goldstone (5/-)	20	20	26/6	..	3 15 6
WestinghouseBrake	12½	14	71/3	+ 1/8	3 18 6
West, Allen (5/-)	7½	7½	7/3	..	5 3 5

* Dividends are paid free of Income Tax.

Stocks and Shares (*Continued from page* 427)

value, so to speak, to Globe Telegraph and Trust ordinary shares. Of course it will not do to push the analogy too far, in that a preference stock has a better security—at least, so it was generally supposed until just lately—than an ordinary. But for the investor who contemplates putting money into one or other of these communication stocks, Globe ordinary look to be cheaper, both as regards yield and capital value, than Cable & Wireless preference.

Radio Shares

Dividend payments count for little in the market for radio companies' shares. The public buy the shares upon post-war prospects, and these are held to justify Electric & Musical Industries standing at 29s. to give a return at that price of 2⅜ per cent. on the money. Philco have been a popular counter during the past week or so and, after touching 13s., the price went back to 12s. 3d. on the recurrence last week of the air raids. Cossors have been outstandingly good with a rise of 1s. 6d. to 24s. 6d., an increased dividend being anticipated.

Firmness in Canadian Marconi shares, which was attributed in part to a little buying from Montreal, led to a suggestion that the company may increase its previous dividend of 4 cents, but nothing more tangible than rumour has yet been made public.

Thomas Tilling

Thomas Tilling ordinary shares, which have risen to 58s. as compared with 54s. at the beginning of the year, now afford a return of no more than £3 9s. per cent. on the money, taking the 10 per cent. dividend lately paid as the basis of calculation. The rise in the price is due to hopes of increased dividend distribution by the company after the war.

Meanwhile, it may be mentioned that there are 200 of the company's 5½ per cent. cumulative preference shares, of £5 each, to be obtained in the market at 7¼. These give a return of £3 15s. 9d. per cent. Dividends are due on January 1st and July 1st. The annual service of the dividend calls for £16,500, and available to meet this in the last-published accounts there was £535,000.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

BABCOCK & Wilcox, Ltd.—"Tubulous vapour generators." 12006/42. October 3rd, 1941. (559696.)

British Thomson - Houston Co., Ltd.—"Deposition of substances on surfaces by vaporisation." 17424/42. December 18th, 1941. (559672.) "Electric lamps." 16530/42. November 27th, 1941. (559793.) "Method of forming lead-in seals for enclosed electrical apparatus." 947/43. January 21st, 1942. (559800.)

British Thomson-Houston Co., Ltd., and H. V. Benns.—"Cubicles for electric control devices." 15137. October 28th, 1942. (559734.)

British Thomson-Houston Co., R. Maxted, G. T. Grapes, J. N. Hull and C. H. Hankinson. —"Apparatus for viewing cavities." 16788. November 26th, 1942. (559667.)

Celestion, Ltd., F. G. Cooke and A. F. Wood.—"Apparatus for indicating, controlling, or recording temperature for use with ironing, heating, cooking and refrigerating apparatus and the like." 12037. August 26th, 1942. (559700.)

Delco-Remy & Hyatt, Ltd., Sunvic Controls, Ltd., S. H. Blazey and N. R. Davis.—"Systems of electric motor control." 7053. May 23rd, 1942. (559644.)

W. T. Henley's Telegraph Works Co., Ltd., and F. T. Griffiths.—"Machine for straining stock for use in the rubber and plastics industries." 10786. July 31st, 1942. (559713.)

W. T. Henley's Telegraph Works Co., Ltd., and H. C. Hoban.—"Sealing of the ends of electric cables." 17694. December 12th, 1942. (559796.)

G. Kent, Ltd., J. A. M. Grout, R. W. Warmington and G. Buckley.—"Controlling synchronous movement of electric motors." 11909. August 24th, 1942. (559692.)

Marconi's Wireless Telegraph Co., Ltd.—"Frequency modulation signal detectors." 12116/42. July 31st, 1941. (559705.) "Variable tuning systems for radio signal receiving apparatus and the like." 12117/42. July 1st, 1941. (559717.) "Variable inductance devices for tuning high-frequency electric circuits." 12118/42. July 30th, 1941. (559718.) "Apparatus for exhausting and sealing the envelopes of wireless valves and similar devices." 12115/42. January 31st, 1941. (559753.) "Signal-receiving systems." 8769/42. June 26th, 1941. (559780.)

Meehanite Metal Corporation.—"Magnetic bucket and method of conveying material." 11966/42. February 19th, 1942. (559715.)

W. Partington and Metropolitan-Vickers Electrical Co., Ltd. — "Dynamo - electric machines." 12059. August 26th, 1942. (559701.)

S. J. Smith.—"Electric remote control systems." 14655. October 20th, 1942. (559732.)

Soc. Anon. Perrot Duval and Cie. — "Illuminating devices." 9818/42. July 28th, 1941. (559646.)

P. A. Sporing and Telegraph Condenser Co., Ltd.—"Means for identifying or distinguishing electrical apparatus." 12127. August 28th, 1942. (559720.)

Standard Telephones & Cables, Ltd. — "Metal-to-glass or like material seals." Cognate applications 1534/43 and 1535/43. January 31st, 1942. (559806.)

Standard Telephones & Cables, Ltd., and S. H. Towner.—"Electro-magnetic relays." 11581. August 18th, 1942. (559690.)

Standard Telephones & Cables, Ltd., E. M. S. McWhirter, R. H. Dunn and C. H. Chambers.— "Arrangement for indicating a characteristic of an alternating-current electric supply system." 11933. August 25th, 1942. (Addition to 547665.) (559654.)

Teletype Corporation.—"Printing telegraph apparatus." 13844/42. September 20th, 1941. (559731.)

A. A. Thornton (Philco Radio & Television Corporation).—"Volume control for radio-phonographs and like sound-reproducing apparatus." 17889. December 16th, 1942. (559673.)

Wallace & Tiernan Products, Inc.—"Electrical determination or control of the amount of oxidising or reducing substances in liquids." Cognate applications 1089/42, 1090/42 and 1091/42. December 28th, 1940. (559708.)

Westinghouse Electric International Co.— "Control systems for vapour-electric discharge devices." 16431/42. November 26th, 1941. (559666.) "Electrical measuring devices." 17032/42. December 2nd, 1941. (559669.)

H. K. Whitehorn, W. F. Young and S. H. Gordon.—"Electric flash welding." Cognate applications 11979/42 and 14723/42. August 25th, 1942. (559658.)

Patent Applications

NOTICE is given that applications have been made for the restoration of a number of patents in the name of V. Hope which ceased owing to the non-payment of fees. They are Nos. 447,253, 452,156, 452,554, 467,177, 480,690, 481,544, 493,100 and 493,988 relating to switches, fuses and conduit fittings. Notice of opposition must be given to the Patent Office, 25, Southampton Buildings, W.C.2, on or before May 1st.

An order has been made restoring patent No. 417,848/1932 granted to A. P. Turnbull and another for "Improvements in electric lampholders."

An application for an extension of the period of letters patent No. 307221, "Improvements on boiling plates for electric cookers," dated April 28th, 1928, has been made on behalf of Florence U. Howard and B. U. Howard (personal representatives of the late A. J. Howard), L. V. Turner, and the Revo Electric Co., Ltd. Notices of opposition must be delivered to the Royal Courts of Justice, London, W.C.2 (Room 239) at least eleven days before April 25th, the date of hearing, and a copy served upon Barlow, Lyde & Gilbert, 165 Fenchurch Street, E.C.3, and the solicitor to the Board of Trade.

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Abertillery. — March 30th. Electricity Department. Materials, including cables, meters, lamps for public lighting and domestic apparatus, for the year ending March 31st, 1945. (March 10th.)

Lincolnshire.—Public Assistance Committee. Goods and materials, including electric lamps, for institutions and children's homes, for the six months ending September 30th. Forms of tender from the Public Assistance Officer, County Offices, Sleaford, Lincs.

North-West Midlands.—May 10th. Joint Electricity Authority. Piping equipment and overhead electric cranes. (March 3rd.)

Wortley.—March 31st. R.D.C. Electrically driven borehole pumping unit. J. Morton, Council Offices, Grenoside, near Sheffield.

Orders Placed

Glasgow.—Municipal Transport Committee. Accepted. Trolley wire.—Frederick Smith & Co. Asbestos-covered wire.—London Electric Wire Co. & Smiths. Armature coils.—Oldfield Engineering Co.

Hebburn-on-Tyne. — U.D.C. Accepted. Electrical repairs at Council houses.—W. Scott and W. Warburton.

London.—ISLINGTON.—Electricity Committee. Accepted for twelve months:—Transformers.—Hackbridge; B.E.T.; Lindley Thompson. Transformer tanks.—Alfred Allen & Son. Tinned copper wire and fuses.—Lighting, Heating & Traction Supplies Co. Cables.—Aberdare; Britannic; B.I.; T.C.M.; Edison Swan Cables. Iron pipes.—Clay Cross Co. Boxes.—Callender's; W. Lucy & Co.; Henley's; Siemens Bros.; Aero Engines. Meters.—Met.-Vick; Aron; Sangamo Weston. Lamps, etc.—B.T.H.; Crompton Parkinson; Philips Lamps; G.E.C.; Ensign Lamps. Earthenware pipes and troughs.—Doulton & Co.; John H. Turner & Lisney; H. J. Baldwin & Co. Cable covers.—Cable Covers, Ltd. Mica sheets.—Dacier. Compound.—Dussek. Tapes.— L. Andrews & Co.

Salford.—Electricity Committee. Accepted. Contracts for materials extended for further twelve months.—Metropolitan-Vickers; Ferguson Pailin; Dorman & Smith. Supply of cables.—Aberdare Cables; Lancashire Cables.

Health Committee. Supply of "Victor" mobile X-ray unit.—Mottershead & Co.

Stockport.—Electricity Committee. Accepted. Grit arrester (£855).—James Howden & Co. (Land), Ltd. Alarm bell system, auxiliary control room (£127).—G.E.C.

Corporation. Supply of two electric washing machines at Bann Street public washhouses (£265).—T. Bradford & Co.

Warrington.—Type MJA battery.—Chloride.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Ancoats.—Workshop at saw mills, Newton Street; Parkers (Ancoats) Ltd., timber importers, Manchester, 4.

Ashton-in-Makerfield. — Canteen; Penelope Mill Co., Windsor Road.

Ashton-under-Lyne.—Additions, Oxford Road Mills; T. Mason & Son, Ltd., cotton spinners, Oxford Road.

Bolton.—Additions,; Blair & Sumner, Ltd., bleachers, Mill Hill Bleachworks.

Bootle.—Temporary school premises, site of Boys' Secondary School; W. A. Harrison, borough engineer, Town Hall, Bootle, Liverpool, 20.

Bromsgrove.—Three concrete buildings as extensions to Blind Institute, Lickey End; secretary, Institution for the Blind, Carpenter Road, Birmingham, 15.

Consett.—Miners' hostel, for the Ministry of Works, 81, St. Mary's Place, Newcastle-on-Tyne.

Darlington.—Transformer house and canteen for Thomas Summerson & Sons, York Street.

Girls' remand home; borough engineer.

Edmonton.—Offices, Fleecefield site, Brettenham Road; borough engineer, Town Hall, N.9.

Glasgow.—Proposed alterations at Possilpark Tram Depot (£10,000); city architect.

Hebburn-on-Tyne.—Testing house for Reyrolle & Co., Ltd.; Cackett, Burns, Dick & McKellar, architects, 21, Ellison Place, Newcastle-on-Tyne.

School meals kitchen; D. W. Dibble, surveyor.

Horsham.—Maternity home (£9,995); Hoad & Taylor, Ltd.

Isle of Ely.—Scheme for maternity homes for the district; R. D. Robson, county architect, County Hall, March.

Lancaster.—Day nursery, Greaves Park; Edmondson Bros., Main Street Saw Mills, Poulton Road, Morecambe.

Manchester.—Junior and senior R.C. schools; Mgr. J. Masterson, St. Mary's, Longsight, Manchester.

Market Drayton.—Houses on four sites for U.D.C.; J. B. Cooper, architect, 177, Corporation Street, Birmingham.

Merioneth.—Building for school meals, adjoining Barmouth County School; N. L. Jones, county architect, County Offices, Dolgelley.

Merthyr.—Tuberculosis clinic, Castle Field; borough engineer, Town Hall, Merthyr Tydfil.

Monmouthshire.—Canteen, Cefn Forest Council School; C. L. Jones, County Hall, Newport.

Newcastle (Staffs).—Memorial hall (£40,000); Rev. Fr. D. Kelley, The Presbytery, London Road.

Newton Heath.—Canteen; G. Grenfield Baines, 12-24, Guildhall Street, Preston.

Oswestry.—Canteen kitchen, Woodside Junior School; H. Bird Jones, Town Clerk, Guildhall.

Plymouth.—Cookery depot; J. Paton Watson, city engineer, Guildhall.

Rotherham.—Canteen, Canklow Road; J. Brown & Co., Ltd., Parkgate Colliery.

Salford.—Packing and receiving room; Isaac Bury, Ltd., Adelphi Dye and Print Finishing Works, Salford, 3.

Extensions to Grammar School (£2,200); City Engineer's Department, Albion Street, Pendleton, Salford, 6.

Scalby.—Extensions to Moor Lane, Newby, fire station for U.D.C. (£1,207); A. W. Sinclair & H. Pickup, Ltd., builders, Commercial Street, Scarborough.

Stockton-on-Tees.—Maternity home, and additions to Robson Maternity Home; borough engineer.

Prefabricated buildings, Oxbridge Lane, for N.F.S.; Ministry of Works, 81, St. Mary's Place, Newcastle-on-Tyne.

Stockport. — Additions to works; G. P. Kershaw, Ltd., The Carrs, Wellington Street, Stockport.

Additions to foundry; J. Needham & Sons, Ltd., Millgate Foundry, Carrington Road, Portwood, Stockport.

Marine stores depot; J. James & Son, 6-8, Higher Hillgate.

Swansea.—Crematorium, Morriston cemetery; borough architect.

Wakefield.—Steel building as works extensions; Bradley & Craven, Ltd., Colliery engineers, Westgate Common, Wakefield.

Walsall.—Houses (10), Coalpool estate; borough engineer.

Warrington.—Extensions to electrical substations on 12 sites for Electricity Committee; N. T. Smith, borough electrical engineer.

West Hartlepool.—Fitting shop, Mainsforth Terrace; South Durham Steel & Iron Co., Ltd.

West Sussex.—Junior technical school, Worthing, rebuilding senior girls' school, Southwick, and additions to children's homes, Chichester; county architect, Chichester.

York.—Central college and four junior colleges; C. J. Minter, city engineer, Guildhall.

Forthcoming Events

Monday, March 27th.—*London.*—At Northampton Polytechnic, E.C.1. Electrodepositors' Technical Society. "Nickel Deposition from Low pH Electrolytes," by Mr. N. R. Laban, B.Sc.

Newcastle-on-Tyne.—Neville Hall, 6.15 p.m. I.E.E. North-Eastern Centre. "Maintenance of Distribution Plant and Mains on AC Networks," by Messrs. F. N. Beaumont, B.Sc.(Eng.), and F. A. Geary.

Wigan.—Mining & Technical College, 7 p.m. Association of Mining Electrical & Mechanical Engineers (N.W. Branch). Lecture on "Underground Fires," by Mr. A. J. G. Coulshed.

Tuesday, March 28th.—*London.*—Meeting at Institution of Electrical Engineers arranged by the Institute of Fuel and the British Coal Utilisation Research Association. Symposium of papers on "Underfeed Stokers." Morning session 10.30 to 12.30; afternoon, 2.30 to 4.30.

London.—Institution of Electrical Engineers, 5.30 p.m. Transmission Section. Discussion on the Supply and Distribution sections of the report of Sub-Committee No. 3 of the Post-War Planning Committee, to be opened by Mr. P. E. Rycroft, M.B.E.

Thursday, March 30.—*London.*—Institution of Electrical Engineers, 5.30 p.m. Ordinary meeting. "Restriking Voltage as a Factor in the Performance, Rating and Selection of Circuit-breakers," by Messrs. J. A. Harle, M.Sc., and R. W. Wild.

Cambridge.—University Engineering Department, Trumpington Street, 8.15 p.m. I.E.E. Cambridge & District Wireless Group. Paper, illustrated by cinematograph film, on "Transients on Transmission Lines," by Mr. R. H. Angus, M.A.

Saturday, April 1st.—*Bristol.*—At Merchant Venturers' Technical College, 3.30 p.m. I.E.E. Bristol Students' Section. "Some Automatic Features in Generating Stations," by Mr. F. H. Guzdar.

Manchester.—16, St. Mary's Parsonage, 2.30 p.m. Junior Institution of Engineers (N.W. Section). "Some Notes on the Design of Switchgear Operating Mechanisms," by Mr. H. H. Daniels.

Monday, April 3rd.—*London.*—At Institution of Electrical Engineers, 7 p.m. London Students' Section. "Motor Coach Trains and their Operation on British Suburban Railways," by Mr. B. J. Prigmore, B.A.

London.—At Austrian Centre, 69, Eton Avenue, N.W.3, 7.15 p.m. Association of Austrian Engineers, Chemists and Scientific Workers in Great Britain. "Modern Trends in Electrical Insulation," by Mr. J. Rubinstein (research engineer, Ferguson, Pailin, Ltd.).

Birmingham.—At James Watt Institute, 6 p.m. I.E.E. South Midland Centre. "Restriking Voltage as a Factor in the Performance, Rating and Selection of Circuit-breakers," by Messrs. J. A. Harle, M.Sc., and R. W. Wild.

Chester.—Corporation Electricity Showrooms, 22, Northgate Street. I.E.E. North Western and Mersey Centres and Chester Engineering Society. "Standardisation in Great Britain of Single-Circuit Overhead Lines up to 33 kV," by Messrs. H. Willott Taylor and K. L. May.

Sheffield.—Central Library, Tudor Place, 6 p.m. I.E.S. Sheffield Centre. "Post-War Planning of Lighting in Dwellings and Public Buildings," by Mr. J. T. Grimshaw.

Leeds.—Corporation Electricity Showrooms, The Headrow, 5.15 p.m. I.E.S. Leeds Centre. Paper on "Lighting in the Tailoring and Garment Making Industry."

Bath.—Pump Rooms, 7 p.m. I.E.S. Bath & Bristol Centre. Lecture on "Application of Plastics to Modern Lighting Fittings."